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AFWAL-TR-82-2017

TRANSONIC FAN/COMPRESSOR ROTOR DESIGN STUDY

Volume III

D.E. Parker and M.R. Simonson

General Electric Company
Aircraft Engine Business Group
Advanced Technology Programs Dept.
Cincinnati, Ohio 45215

February 1982

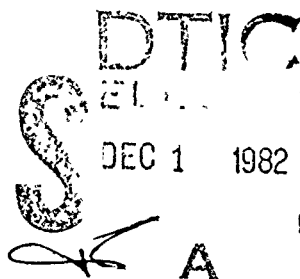Final Report for Period September 1980 - February 1982

Aero Propulsion Laboratory
Air Force Wright Aeronautical Laboratories
Air Force System Command
Wright-Patterson Air Force Base, Ohio 45433

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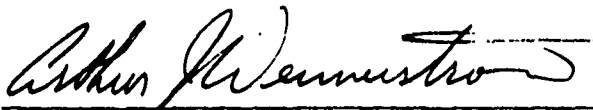| REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM	
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Compressor	Blade Thickness
Rotor	Camber Distribution
Aerodesign	Throat Margin
Aerodynamics	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Volumes I through VI of this report describes the aerodynamic design of a series of five transonic rotors all parametrically related to a baseline design documented in Technical Report AFAPL-TR-79-2078. Each of the five designs deviate from the base line, in so far as practical, by a variation of one parameter only. The parametric variations are specified at the rotor tip. The original hub characteristics were preserved to the maximum extent practical. The varied parameter was adjusted along the span.

This volume describes the aerodynamic design details of the Phase II rotor. The Phase II rotor has the tip airfoil maximum thickness located at 55% of meanline length as compared with 70% for the baseline rotor. The location of maximum thickness varied linearly with stream function to 56% of meanline length at the hub, which is the same as the baseline rotor.

VOLUME III

PHASE II ROTOR DESIGN

Foreword

    This Final Technical Report was prepared by the Advanced Technology
Programs Department, Aircraft Engine Business Group, General Electric Company,
Evendale , Ohio for the United States Air Force Systems Command, Air Force
Wright Aeronautical Laboratories Wright-Patterson Air Force Base, Ohio under
Contract F33615-80-C-2059. The work was performed over a period of
one year starting in September 1980. Effren Strain (Captain USAF) was the
Air Force Project Engineer for this program.

    This report describes the results of an effort to aerodynamically define
five rotor designs, all parametrically related to a base line design which
could be evaluated by future testing in order to define the sensitivity
of transonic blade rows to several design variables.

    For the General Electric Company Mr. D.E. Parker was the Technical
Program Manager for this program. Mr. M.R. Simonson was the principal
investigator. Mr. A.J. Bilhardt was the overall Program Manager.

VOLUME III

TABLE OF CONTENTS

VOLUME III

LIST OF ILLUSTRATIONS

LIST OF SYMBOLS AND ABBREVIATIONS

1. Used in Circumferential Average Flow Output Tables

STA	calculation station number	
WTF	total airflow	
PSIC	stream function (0 = tip (OD), 1 = hub (ID))	
Z	axial location	inches
R	radius	inches
PHI	streamline slope	degrees
CURV	streamline curvature ⌣ = neg., ⌢ = pos.	1/inches
VM	meridional velocity	ft/sec
CU	absolute tangential velocity	ft/sec
ALPHAM	absolute flow angle on stream surface	degrees
MM	meridional Mach number	
SL	calculation streamline number	
BLDBLK	flow blockage factor (free area − blocked area)/free area	
PS	static pressure	psia
PT	total pressure	psia
TT	total temperature	degrees
BETAM	relative flow angle on stream surface	degrees
UREL	relative velocity	ft/sec
MREL	relative Mach number	
VABS	absolute velocity	ft/sec
MABS	absolute Mach number	
GAMMA	specific heat ratio	
PT-RAT	total pressure/inlet total pressure	
TT-RAT	total temperature/inlet total temperature	
RCU	radius x tangential velocity	in-ft/sec
CZ	axial velocity	ft/sec
PCT IMM	percent annulus immersion from tip (OD)	
RAD	average of leading and trailing edge streamline radii	inches
ACC PT RATIO	cumulative total pressure ratio	
ACC TT RATIO	cumulative total temperature ratio	

LIST OF SYMBOLS AND ABBREVIATIONS

1. Used in Circumferential Average Flow Output Tables (Cont'd)

AD.	adiabatic efficiency	
POLY	polytropic efficiency	
Axial VEL R	axial velocity ratio across blade row	

2. Used in Stream Surface Blade Coordinate Tables

PT	point number	
PCT X	fraction of meridional distance from leading edge	
X	meridional coordinate on meanline	inches
Y	tangential coordinate on meanline	inches
B*M	meanline angle on stream surface	degrees
T(M)	thickness of blade perpendicular to meanline	inches
XS	meridional coordinate on suction surface	inches
YS	tangential coordinate on suction surface	inches
XP	meridional coordinate on pressure surface	inches
YP	tangential coordinate on pressure surface	inches

3. Used in Plane Section Coordinate Tables

Z	axial coordinate of stacking axis	inches
R	radius of coordinate system origin	inches
MU	tilt angle in axial direction	degrees
ETA	tilt angle in tangential direction	degrees
RHO	section height	inches
PT	point number	
ALPHA	axial coordinate	inches
ZETA*	meanline angle from axial	degrees
UPSILON	coordinate perpendicular to ALPHA and radius	inches
PCT AL	fraction of axial distance from leading edge	
T/C	local thickness/chord ratio	

SECTION X
DESIGN OF PHASE II ROTOR

1. INTRODUCTION

The specification of the chord-wise location of airfoil maximum thickness of transonic/compressor rotors has often been defined more on the basis of historical practice than on a knowledge of its aerodynamic effect. Research by NACA in the 1950's generally indicated that as relative inlet Mach numbers rose, it was desirable to move the location of maximum thickness aft on an airfoil.

The early work, however, was done with airfoils having significant positive camber. Today, many airfoils have little overall relative turning in the tip region, and frequently have S-shaped mean lines: negative camber followed by some positive camber. In some cases, a forward shift in maximum airfoil thickness may help achieve the desired airfoil suction surface shape, with a less S-shaped mean line. There is also incentive to move the maximum thickness forward to make the blade more capable of withstanding a bird strike without excessive damage.

To get more definitive aerodynamic data on the effect of the location of airfoil maximum thickness, the Phase I blade has been designed with the maximum thickness located at 40%; the Phase II blade with maximum thickness at 55%, to compare with the base line rotor which has its tip maximum thickness at 70% of mean line length.

2. DESIGN PROCEDURE

The "data match" circumferential average flow solution, which was previously described in Volume I, was used as a starting point for the design of the Phase II rotor. The annulus blockage used in the internal blade calculation stations was adjusted to be consistent with the forward shift of the airfoil maximum thickness. The assumed chord-wise distribution of work was iteratively adjusted to obtain a calculated chordwise distribution of static pressure similar to that of the data match calculations of the baseline rotor. Also the blade meanline departure angle (the difference between the air angle and the meanline angle) were adjusted to maintain the same throat area, and flow induction capacity as the baseline blade. To adjust for the increased blade blockage in the forward half of the blade, and to better match the data match status pressure distribution in the hub, the hub contour internally within the rotor was modified

1

slightly relative to the baseline rotor. The Phase II rotor hub is .012 inches lower in radius at the 60 percent chord location and is faired into the baseline contour near the edge locations.

After each modification to the chordwise work distribution and/or departure angles, revised blade annulus blockage and blade lean angles were calculated and input to the circumferential Average Flow Determination (CAFD) computer program for the next iteration.

The rotor exit radial distribution of total pressure and temperature was maintained the same as the data match of the baseline rotor.

The resulting streamline static pressure distribution for the Phase II blade is compared with the data match of the baseline rotor on Figure 32.

The assumed streamline work input (as a fraction of the total streamline work) is plotted versus percent axial projection in Figure 33. The tip streamline is the one on the left. Each subsequent streamline is indexed to the right by the value of its stream function (fraction of the total flow from the tip). The dotted lines are lines of constant percent axial projection.

A method of characteristics computer program was used to analyze the flow in the cascade flow induction region for streamlines 3 and 6 to assure that the rotor would achieve the design flow. For other streamlines, the difference between the suction surface angle and the "free flow" streamline angle was compared with similar data from the data match calculations of the baseline rotor. This then, was used as a guide in setting the suction surface angle in the flow induction region.

Somewhat larger incidence angles were used to help maintain the same flow induction capacity as the baseline rotor. Phase II blade incidence angles are shown on Figure 34.

A modified version of Carter's Rule was used to calculate a reference deviation angle for the baseline rotor. This procedure converts the vector diagrams (from the data match calculations) to an equivalent two-dimensional set of vectors which would produce the same circulation as the actual blade taking into account the change in streamline radius and meriodional velocity. The difference between the deviation angle implied by the data match calculations and the reference deviation angle was then added to the reference deviation

2
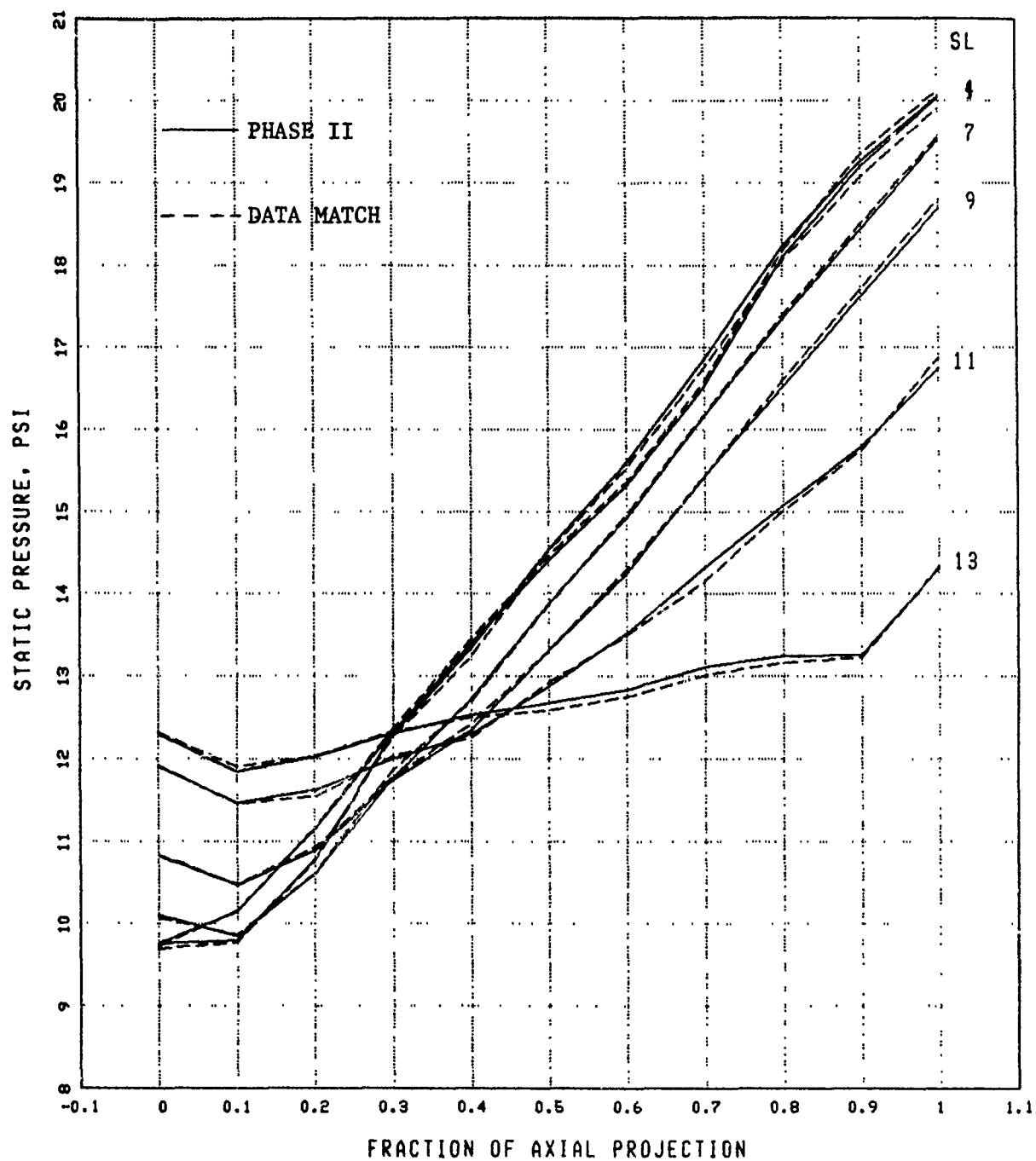
Figure __32__ . Phase II Rotor Static Pressure Distribution

3

STREAMLINE NO.
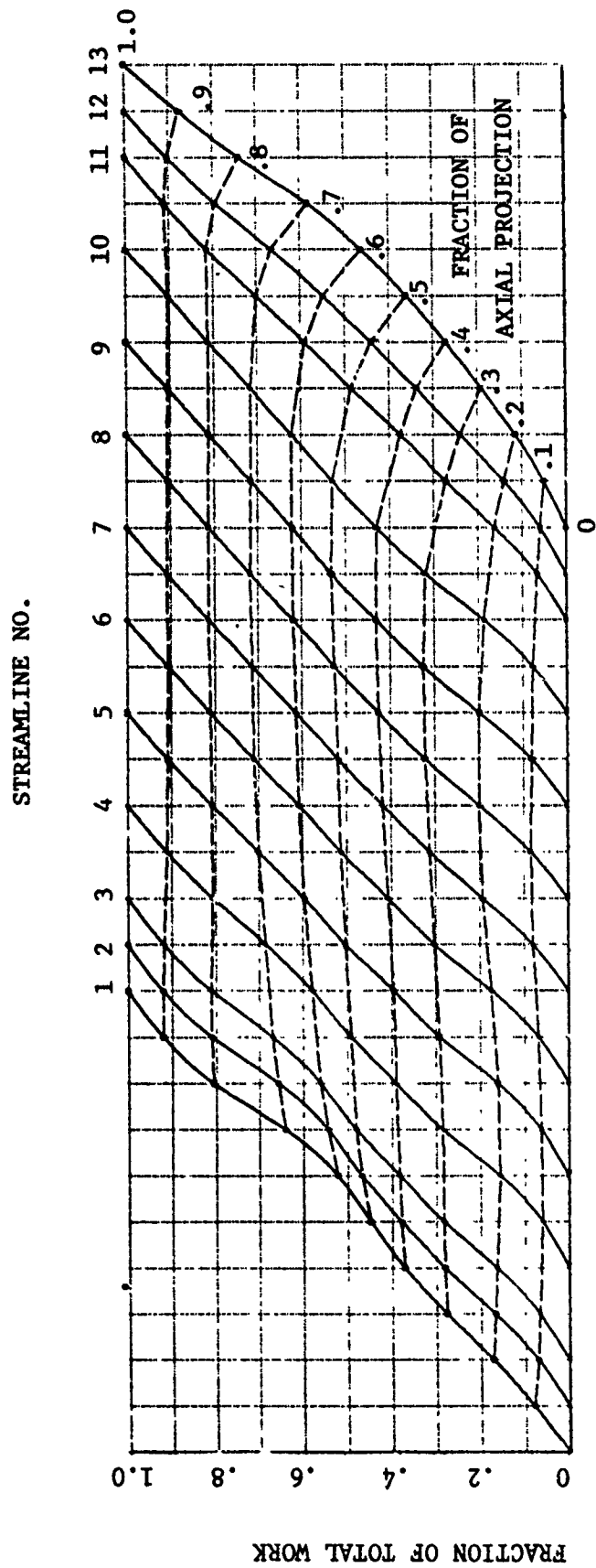
Figure 33. Phase II Rotor Intrablade Work Distribution

4

angle calculated from the modified Carter's Rule for the Phase II blade. Phase II Rotor deviation angles are shown on Figure 35. A plot of departure angles for each streamsurface section is shown in Figure 36. Once the intra-blade work distribution was chosen these departure angles were required to satisfy the desired incidence angles, deviation angles, and passage area ratios. The resulting streamsurface tip section of the Phase II rotor is compared to that of the baseline rotor in Figure 37. The "deviation angle minus reference deviation angle" for the Phase II rotor was kept essentially the same as the data match analysis although there are some small differences. Figure 38 shows the "delta deviation" compared to the data match of the baseline design.

If the performance of a new rotor design is to be accurately evaluated by comparing overall stage performance with the baseline design then it is important that the stator have nearly the same entering conditions in both cases. Figure 39 shows a comparison of the Phase II stator incidence angles with the data match base. As can be seen the differences are small.

Figure 40 shows the radial distribution of Phase II rotor throat margin and compares it to the data match case. The throat margin for a streamsurface blade section is defined here as the percent of excess throat area over and above the minimum theoretical area required to pass the streamtube flow at a throat Mach number of 1.0 and assuming a total pressure loss equivalent to a normal shock at the upstream Mach number. In a rotor the effect of radius change (between the leading edge and throat) on the relative total enthalpy and pressure is included. As can be seen in Figure 40 the Phase II rotor throat margin is nearly identical to that of the data match of the baseline design.

Details of the Phase II rotor design are given in Section VIII.

5
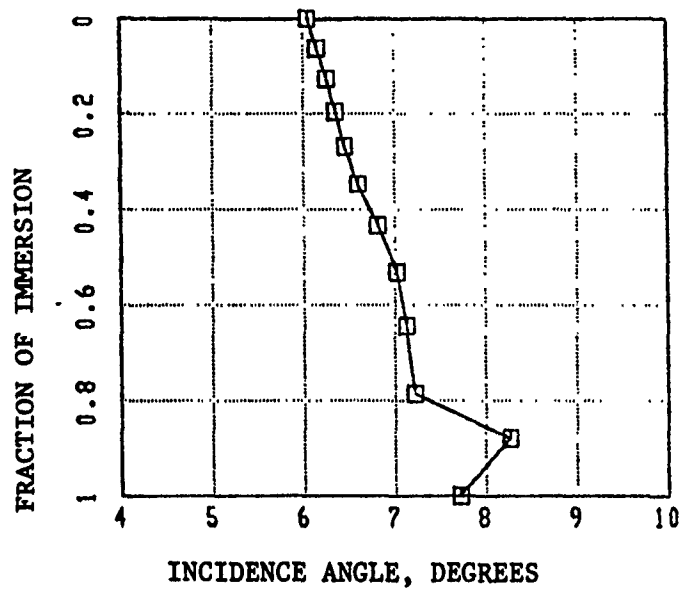
Figure __34__. Phase II Rotor Incidence Angle Versus
Fractional Immersion
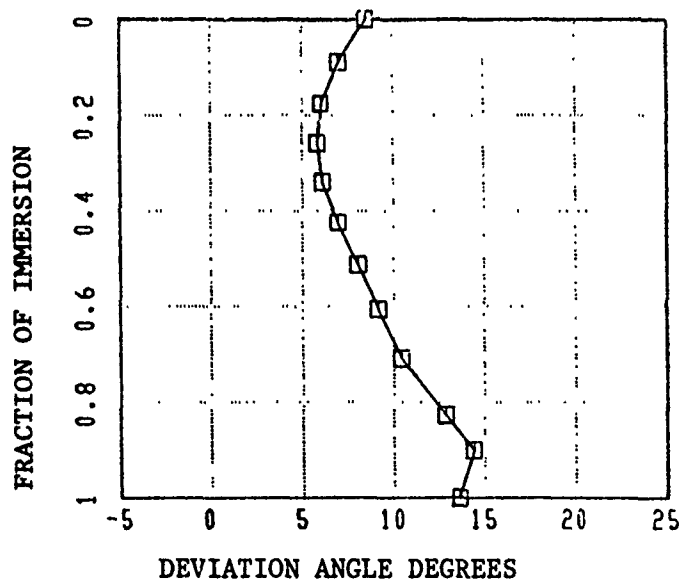
Figure __35__. Phase II Rotor Deviation Angle
Versus Fractional Immersion

6
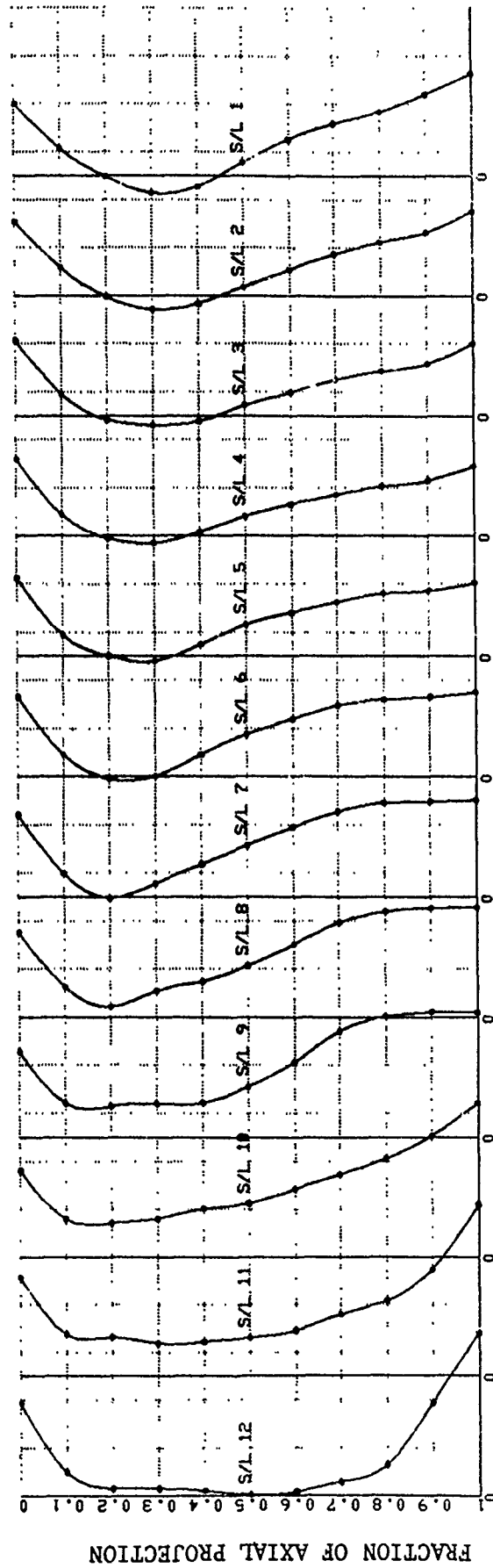
DEPARTURE ANGLE, 1 DIVISION = 4 DEGREES

FIGURE 36. Phase II Rotor Intrablade Departure Angle
Distribution
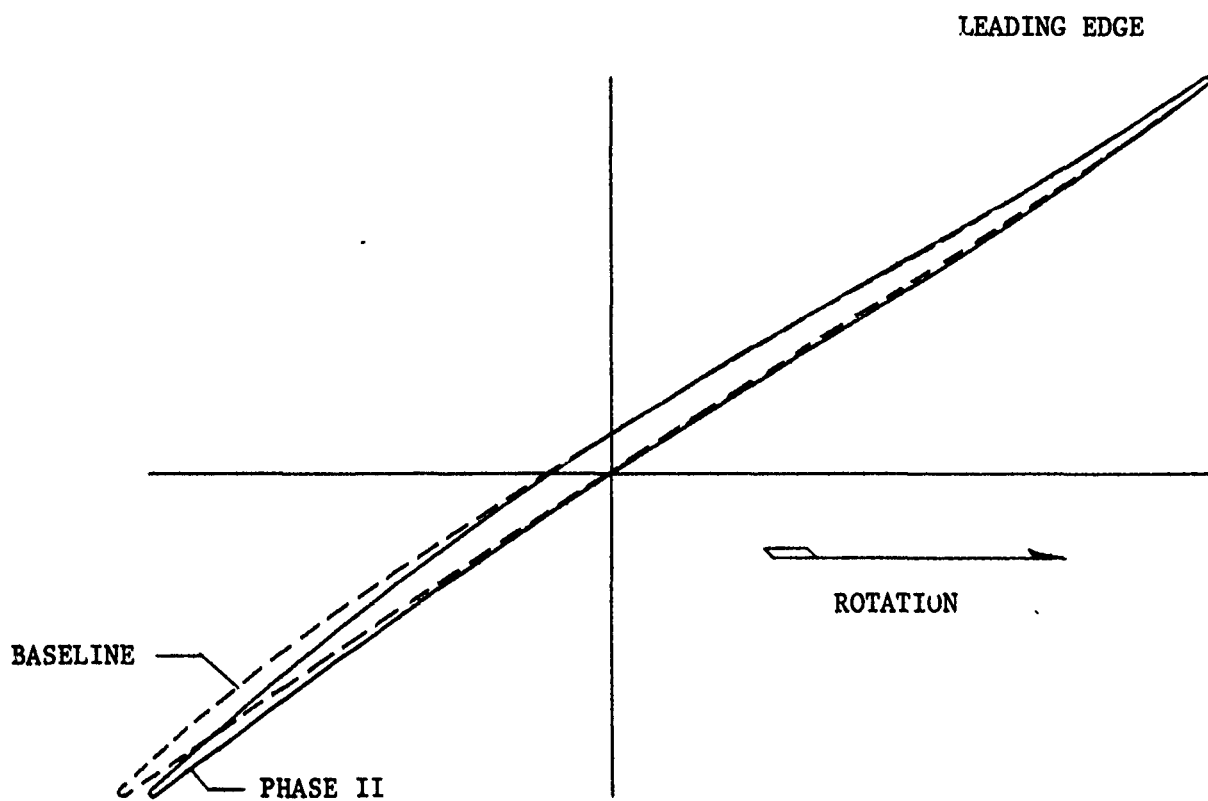
Figure 37. Phase II Rotor Streamsurface Tip Section Compared
with Baseline Design

8
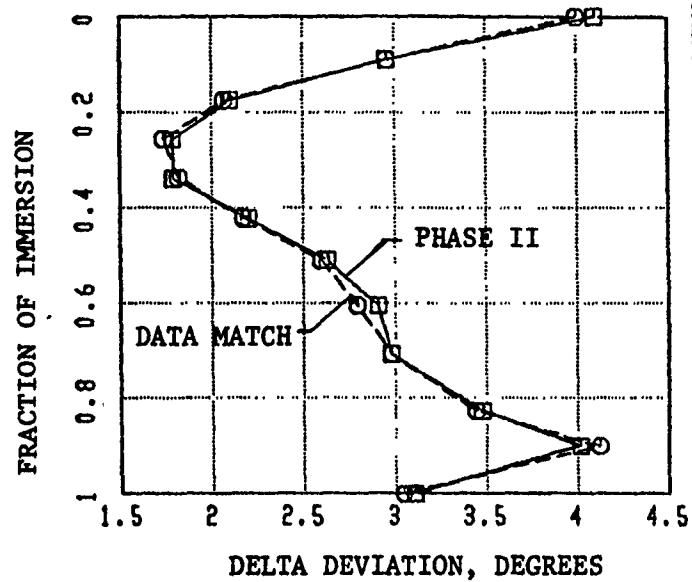
Figure 38 .   Phase II Rotor Deviation Angle Minus
                Reference Deviation Angle Compared
                With Data Match
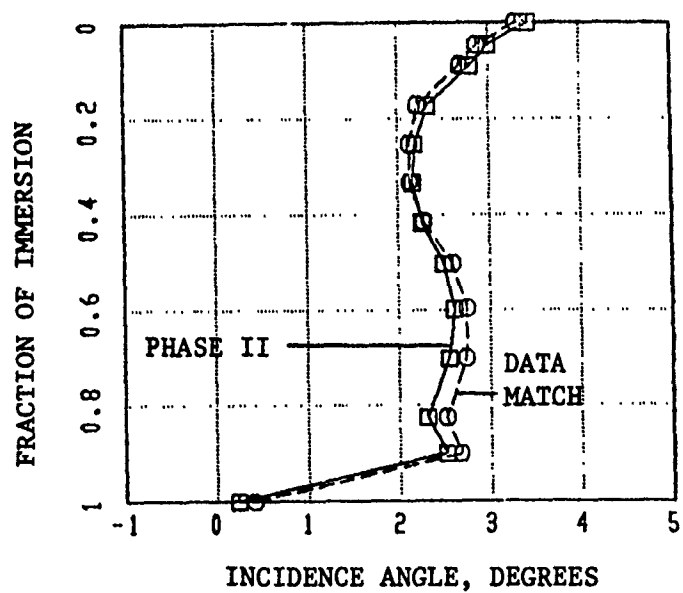
Figure 39 .   Phase II Stator Incidence Angle Compared
                With Data Match

9
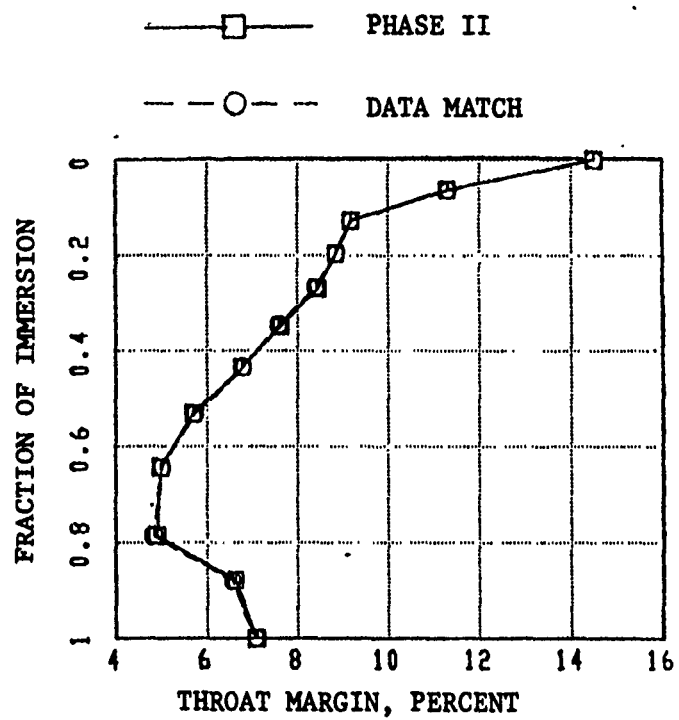
Figure 40 .   Phase II Rotor Throat Margin
Compared With Data Match

SECTION XI
DETAILS OF PHASE II ROTOR DESIGN

1. CIRCUMFERENTIAL AVERAGE FLOW SOLUTION

The following tabulation presents the detail results of the Phase II Rotor circumferential average flow computation. Each page of the tabulation gives results for one calculation station. Figure 41 shows the calculation station locations within the flowpath. At each calculation station various aerodynamic parameters are given on each of thirteen calculation streamlines. Also given are several mass averaged station flow properties. The Phase II rotor blade forces are included at the end of this tabulation.
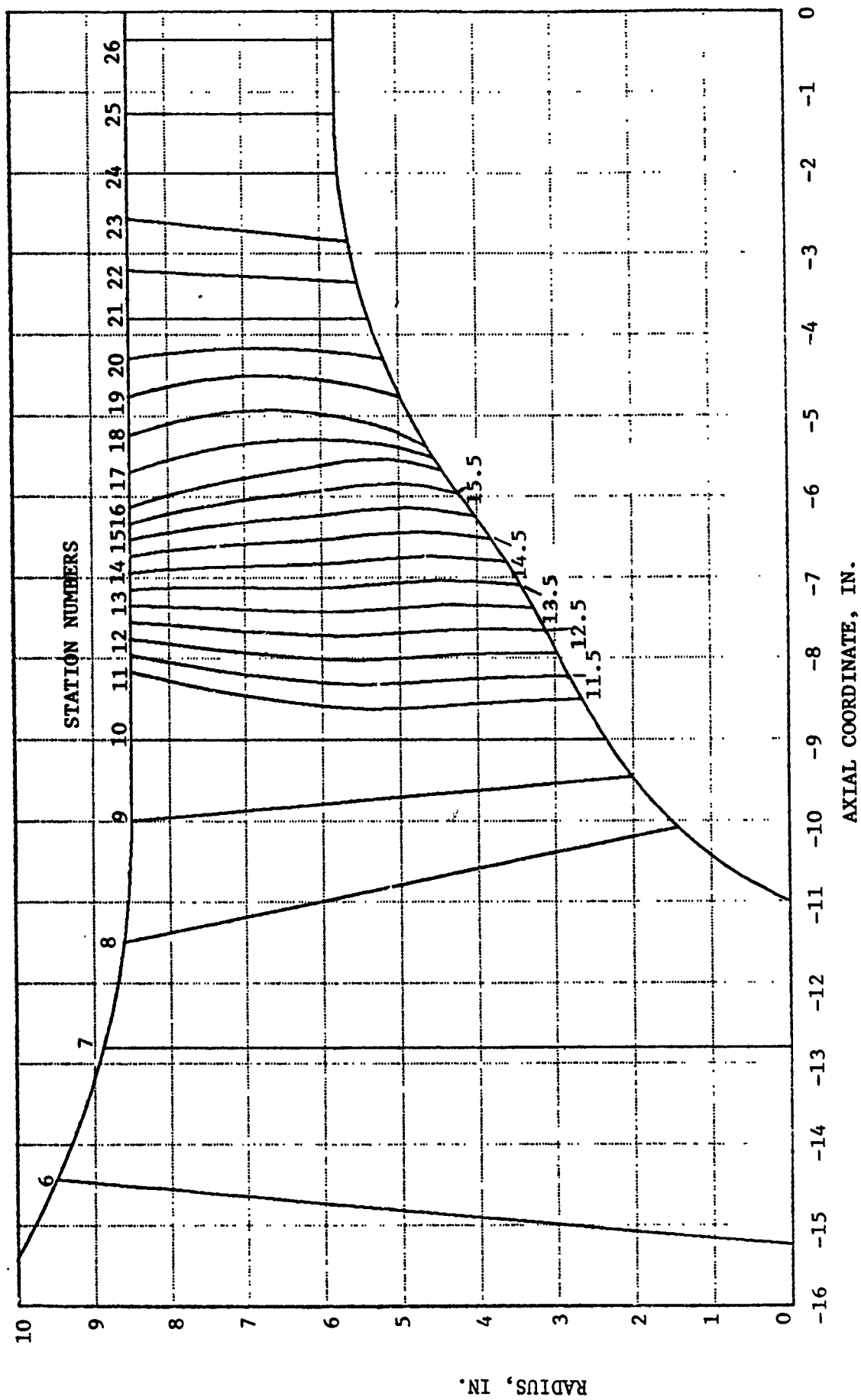
Figure 41. Compressor Flowpath With Calculation Stations

INLET

```
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```

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-18.800	13.207	-50.10	0.0831	150.4	0.	0.	0.135
0.050	-18.800	12.564	-43.54	0.	181.0	0.	0.	0.163
0.100	-18.800	12.020	-40.31	0.	195.9	0.	0.	0.176
0.200	-18.800	11.027	-34.70	0.	218.6	0.	0.	0.196
0.300	-18.800	10.099	-29.90	0.	237.1	0.	0.	0.213
0.400	-18.800	9.193	-25.65	0.	252.4	0.	0.	0.227
0.500	-18.800	8.277	-21.78	0.	265.1	0.	0.	0.239
0.600	-18.800	7.319	-18.17	0.	275.9	0.	0.	0.248
0.700	-18.800	6.277	-14.68	0.	284.9	0.	0.	0.257
0.800	-18.800	5.083	-11.19	0.	292.5	0.	0.	0.264
0.900	-18.800	3.569	-7.35	0.	298.9	0.	0.	0.270
0.950	-18.800	2.516	-4.92	0.	301.6	0.	0.	0.272
1.000	-18.800	0.000	0.	0.	304.0	0.	0.	0.274

SL	BLDBLK	PS	PT	TT	BETAM	VM	VREL	MREL	VABS	MABS
1	0.997	14.510	14.696	518.7	86.31	150.4	2335.4	2.095	150.4	0.135
2	0.997	14.427	14.696	518.7	85.33	181.0	2224.5	1.997	181.0	0.163
3	0.997	14.382	14.696	518.7	84.72	195.9	2130.2	1.913	195.9	0.176
4	0.997	14.305	14.696	518.7	83.59	218.6	1958.1	1.760	218.6	0.196
5	0.997	14.237	14.696	518.7	82.42	237.1	1797.9	1.617	237.1	0.213
6	0.997	14.177	14.696	518.7	81.16	252.4	1641.9	1.477	252.4	0.227
7	0.997	14.124	14.696	518.7	79.71	265.1	1484.6	1.337	265.1	0.239
8	0.997	14.077	14.696	518.7	77.94	275.9	1320.6	1.190	275.9	0.248
9	0.997	14.037	14.696	518.7	75.58	284.9	1143.7	1.031	284.9	0.257
10	0.997	14.002	14.696	518.7	71.94	292.5	943.5	0.850	292.5	0.264
11	0.997	13.972	14.696	518.7	64.61	298.9	697.2	0.629	298.9	0.270
12	0.997	13.959	14.696	518.7	55.81	301.6	536.8	0.484	301.6	0.272
13	0.997	13.947	14.696	518.7	0.00	304.0	304.0	0.274	304.0	0.274

```
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0.050	-14.450	9.254	-24.10	-0.1028	507.6	0.	0.	0.464
0.100	-14.470	9.020	-22.95	-0.0955	501.0	0.	0.	0.458
0.200	-14.513	8.532	-20.65	-0.0825	489.3	0.	0.	0.447
0.300	-14.558	8.010	-18.38	-0.0712	478.4	0.	0.	0.436
0.400	-14.606	7.446	-16.13	-0.0614	467.7	0.	0.	0.426
0.500	-14.660	6.829	-13.88	-0.0529	457.2	0.	0.	0.416
0.600	-14.719	6.141	-11.59	-0.0455	446.4	0.	0.	0.406
0.700	-14.787	5.351	-9.23	-0.0390	434.9	0.	0.	0.395
0.800	-14.869	4.402	-6.74	-0.0330	422.1	0.	0.	0.383
0.900	-14.978	3.142	-4.03	-0.0257	407.0	0.	0.	0.369
0.950	-15.057	2.234	-2.57	-0.0190	398.2	0.	0.	0.361
1.000	-15.250	0.000	0.	0.	387.6	0.	0.	0.351

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MA
1	0.997	12.624	14.696	518.7	72.90	1750.4	1.601	514.6	0.471
2	0.997	12.677	14.696	518.7	72.73	1710.1	1.564	507.6	0.434
3	0.997	12.726	14.696	518.7	72.53	1668.8	1.525	501.0	0.458
4	0.997	12.812	14.696	518.7	72.00	1583.2	1.445	489.3	0.447
5	0.997	12.892	14.696	518.7	71.30	1492.2	1.361	478.4	0.436
6	0.997	12.968	14.696	518.7	70.41	1394.7	1.271	467.7	0.426
7	0.997	13.042	14.696	518.7	69.22	1288.9	1.174	457.2	0.416
8	0.997	13.116	14.696	518.7	67.61	1172.0	1.066	446.4	0.406
9	0.997	13.193	14.696	518.7	65.27	1039.7	0.945	434.9	0.395
10	0.997	13.277	14.696	518.7	61.48	884.1	0.803	422.1	0.383
11	0.997	13.374	14.696	518.7	53.72	687.7	0.624	407.0	0.369
12	0.997	13.428	14.696	518.7	44.72	560.3	0.508	398.2	0.361
13	0.997	13.493	14.696	518.7	0.00	387.6	0.351	387.6	0.351

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14

INLET

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1.000	-12.800	0.000	0.	0.	383.7	0.	0.	0.348

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.998	11.715	14.696	518.7	68.25	1687.2	1.560	625.1	0.578
2	0.998	11.780	14.696	518.7	68.02	1650.8	1.525	617.7	0.571
3	0.998	11.844	14.696	518.7	67.77	1613.5	1.490	610.3	0.563
4	0.998	11.975	14.696	518.7	67.20	1535.4	1.415	595.0	0.549
5	0.998	12.105	14.696	518.7	66.48	1452.3	1.337	579.5	0.533
6	0.998	12.235	14.696	518.7	65.57	1363.0	1.253	563.8	0.518
7	0.998	12.366	14.696	518.7	64.37	1265.9	1.162	547.6	0.502
8	0.998	12.502	14.696	518.7	62.75	1158.6	1.061	530.4	0.486
9	0.998	12.649	14.696	518.7	60.45	1036.9	0.948	511.3	0.468
10	0.998	12.819	14.696	518.7	56.84	893.0	0.815	488.5	0.446
11	0.998	13.050	14.696	518.7	49.86	707.2	0.644	455.9	0.415
12	0.998	13.234	14.696	518.7	42.24	579.1	0.526	428.7	0.390
13	0.998	13.516	14.696	518.7	0.00	383.7	0.348	383.7	0.348

```
             STA   7.000  MASS AVERAGED PROPERTIES
PT= 14.696   TT= 518.69  GAMMA=1.4017  PT-RAT= 1.000  TT-RAT= 1.000
RCU=  0.     VM= 539.1  CZ= 532.1  MM=0.495  MABS=0.495  MREL=1.109
```

INLFT   STA= 8.000   FREE

WTF= 61.365   I= 4   MTIP= 40   AFLOW= 224.06   D*C=0.   D*H=0.

OPTX=DPP   OPTY=FREE   ITYPE=0   INBR=0   ABC=0.   ABH=0.

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-11.499	8.608	-8.21	-0.0953	711.8	0.	0.	0.665
0.050	-11.461	8.412	-7.49	-0.0964	702.9	0.	0.	0.656
0.100	-11.421	8.211	-6.86	-0.0909	693.5	0.	0.	0.646
0.200	-11.339	7.790	-5.59	-0.0814	675.5	0.	0.	0.628
0.300	-11.250	7.341	-4.26	-0.0742	658.5	0.	0.	0.611
0.400	-11.155	6.858	-2.79	-0.0693	641.9	0.	0.	0.595
0.500	-11.052	6.333	-1.12	-0.0666	624.9	0.	0.	0.578
0.600	-10.938	5.753	0.87	-0.0664	606.2	0.	0.	0.559
0.700	-10.808	5.095	3.34	-0.0693	583.9	0.	0.	0.538
0.800	-10.656	4.319	6.67	-0.0766	554.7	0.	0.	0.509
0.900	-10.459	3.317	12.09	-0.0933	510.9	0.	0.	0.467
0.950	-10.323	2.629	17.75	-0.1212	468.4	0.	0.	0.427
1.000	-10.086	1.421	47.99	0.1910	434.2	0.	0.	0.395

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.997	10.922	14.696	518.7	64.89	1677.5	1.567	711.8	0.665
2	0.997	11.005	14.696	518.7	64.66	1642.4	1.532	702.9	0.656
3	0.997	11.094	14.696	518.7	64.42	1606.3	1.497	693.5	0.646
4	0.997	11.262	14.696	518.7	63.83	1531.6	1.424	675.5	0.628
5	0.997	11.417	14.696	518.7	63.05	1453.2	1.349	658.5	0.611
6	0.997	11.566	14.696	518.7	62.06	1369.9	1.269	641.9	0.595
7	0.997	11.717	14.696	518.7	60.79	1280.4	1.184	624.9	0.578
8	0.997	11.879	14.696	518.7	59.16	1182.4	1.091	606.2	0.559
9	0.997	12.068	14.696	518.7	57.00	1072.2	0.987	583.9	0.538
10	0.997	12.309	14.696	518.7	53.95	942.7	0.866	554.7	0.509
11	0.997	12.652	14.696	518.7	48.89	776.9	0.711	510.9	0.467
12	0.997	12.964	14.696	518.7	44.72	659.2	0.601	468.4	0.427
13	0.997	13.198	14.696	518.7	30.01	501.4	0.456	434.2	0.395

STA 8.000 MASS AVERAGED PROPERTIES

PT= 14.696   TT= 518.69   GAMMA=1.4017   PT-RAT= 1.000   TT-RAT= 1.000

RCU= 0.   VM= 612.1   CZ= 604.6   MM=0.566   MABS=0.566   MREL=1.140

INLET   I = 5   STA= 9.000   AFLOW= 211.87   D+C=0.   FREE

                   OPTX=DPP   MTIP= 53   OPTY=FREE   ITYPE=0   INBR=0   ABC=0.   D+H=0.

WTF= 61.365   ABH=0.

PSIC	Z	R	FHI	CURV	VM	CU	ALPHAM	MM
0.	-9.999	8.500	0.	0.	757.7	0.	0.	0.712
0.050	-9.984	8.315	-1.11	-0.0542	750.8	0.	0.	0.705
0.100	-9.968	8.125	-0.89	-0.0524	742.8	0.	0.	0.697
0.200	-9.935	7.727	-0.29	-0.0504	729.1	0.	0.	0.683
0.300	-9.900	7.304	0.57	-0.0505	715.2	0.	0.	0.668
0.400	-9.862	6.850	1.72	-0.0525	700.0	0.	0.	0.653
0.500	-9.821	6.358	3.22	-0.0566	682.5	0.	0.	0.635
0.600	-9.776	5.815	5.17	-0.0627	661.0	0.	0.	0.614
0.700	-9.725	5.200	7.71	-0.0708	633.4	0.	0.	0.586
0.800	-9.665	4.473	11.13	-0.0788	596.9	0.	0.	0.550
0.900	-9.587	3.541	16.57	-0.0808	546.7	0.	0.	0.502
0.950	-9.536	2.919	21.62	-0.0405	516.0	0.	0.	0.472
1.000	-9.460	2.011	38.65	0.1881	512.0	0.	0.	0.468

SL	BLDBLK	RS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.996	10.477	14.696	518.7	63.20	1680.5	1.579	757.7	0.712
2	0.996	10.545	14.696	518.7	62.90	1648.3	1.547	750.8	0.705
3	0.996	10.623	14.696	518.7	62.61	1614.8	1.514	742.8	0.697
4	0.996	10.755	14.696	518.7	61.87	1546.3	1.447	729.1	0.683
5	0.996	10.889	14.696	518.7	60.98	1474.0	1.377	715.2	0.668
6	0.996	11.033	14.696	518.7	59.93	1396.9	1.303	700.0	0.653
7	0.996	11.197	14.696	518.7	58.69	1313.2	1.222	682.5	0.635
8	0.996	11.394	14.696	518.7	57.21	1220.6	1.133	661.0	0.614
9	0.996	11.642	14.696	518.7	55.38	1115.0	1.032	633.4	0.586
10	0.996	11.959	14.696	518.7	52.91	989.7	0.912	596.9	0.550
11	0.996	12.373	14.696	518.7	48.81	830.3	0.762	546.7	0.502
12	0.996	12.613	14.696	518.7	44.95	729.0	0.667	516.0	0.472
13	0.996	12.644	14.696	518.7	34.73	622.9	0.570	512.0	0.468

STA   9.000   MASS AVERAGED PROPERTIES

PT= 14.696   TT= 518.69   GAMMA=1.4018   PT-RAT= 1.000   TT-RAT= 1.000

RCU= 0.   VM= 663.6   CZ= 655.2   MM=0.617   MABS=0.617   MREL=1.178

INLET   STA= 10.000   FREE

WTF= 61.365   I= 6   MTIP= 66   AFLOW= 204.17   D*C=0.   D*H=0.
               OPTX=DPP   OPTY=FREE   ITYPE=O   INBR=O   ABC=O.   ABH=0.

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-9.000	8.500	0.	0.	771.6	0.	0.	0.726
0.050	-9.000	8.317	0.32	0.0033	771.9	0.	0.	0.727
0.100	-9.000	8.130	0.61	-0.0019	771.9	0.	0.	0.727
0.200	-9.000	7.741	1.38	-0.0119	769.5	0.	0.	0.724
0.300	-9.000	7.331	2.39	-0.0202	763.5	0.	0.	0.718
0.400	-9.000	6.894	3.74	-0.0292	753.7	0.	0.	0.708
0.500	-9.000	6.422	5.49	-0.0394	738.6	0.	0.	0.692
0.600	-9.000	5.904	7.79	-0.0546	715.8	0.	0.	0.669
0.700	-9.000	5.317	10.71	-0.0721	682.2	0.	0.	0.635
0.800	-9.000	4.623	14.38	-0.0874	635.3	0.	0.	0.588
0.900	-9.000	3.732	19.50	-0.0848	575.8	0.	0.	0.530
0.950	-9.000	3.140	23.67	-0.0826	536.7	0.	0.	0.492
1.000	-9.000	2.340	32.46	0.1922	544.7	0.	0.	0.500

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.994	10.340	14.696	518.7	62.78	1686.8	1.588	771.6	0.726
2	0.994	10.337	14.696	518.7	62.26	1658.3	1.561	771.9	0.727
3	0.994	10.337	14.696	518.7	61.72	1629.1	1.534	771.9	0.727
4	0.994	10.361	14.696	518.7	60.61	1567.9	1.476	769.5	0.724
5	0.994	10.420	14.696	518.7	59.45	1502.2	1.413	763.5	0.718
6	0.994	10.517	14.696	518.7	58.22	1431.1	1.344	753.7	0.708
7	0.994	10.664	14.696	518.7	56.91	1352.7	1.268	738.6	0.692
8	0.994	10.883	14.696	518.7	55.51	1264.0	1.181	715.8	0.669
9	0.994	11.199	14.696	518.7	53.98	1160.1	1.080	682.2	0.635
10	0.994	11.625	14.696	518.7	52.09	1034.1	0.957	635.3	0.588
11	0.994	12.136	14.696	518.7	48.84	874.8	0.805	575.8	0.530
12	0.994	12.453	14.696	518.7	45.92	771.4	0.707	536.7	0.492
13	0.994	12.389	14.696	518.7	37.16	683.5	0.627	544.7	0.500

STA 10.000 MASS AVERAGED PROPERTIES

PT= 14.696 TT= 518.69 GAMMA=1.4018 PT-RAT= 1.000 TT-RAT= 1.000
RCU=   0.   VM= 705.3   CZ= 694.0 MM=0.659 MABS=0.659 MREL=1.216

ROTOR1   I= 7   STA= 11.000

WTF= 61.365 OPTX=DPP MTIP= 79 AFLOW= 197.53 OPTY=FREE ITYPE=4 INBR=3

LE ROTOR
D+C=0. D+H=0.
ABC=0. ABH=0.

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-8.166	8.500	0.	0.	829.3	0.	0.	0.787
0.050	-8.204	8.322	0.41	-0.0071	830.3	0.	0.	0.788
0.100	-8.243	8.139	0.79	-0.0063	830.4	0.	0.	0.788
0.200	-8.322	7.760	1.67	-0.0029	829.2	0.	0.	0.787
0.300	-8.397	7.360	2.85	-0.0063	824.3	0.	0.	0.782
0.400	-8.466	6.933	4.40	-0.0143	814.0	0.	0.	0.771
0.500	-8.532	6.471	6.42	-0.0297	795.4	0.	0.	0.751
0.600	-8.592	5.964	9.00	-0.0472	764.5	0.	0.	0.719
0.700	-8.624	5.394	12.13	-0.0570	722.2	0.	0.	0.675
0.800	-8.604	4.732	16.17	-0.0652	671.4	0.	0.	0.624
0.900	-8.548	3.902	21.60	-0.0675	603.4	0.	0.	0.557
0.950	-8.526	3.359	25.67	-0.0517	560.3	0.	0.	0.515
1.000	-8.507	2.653	31.14	0.1541	556.2	0.	0.	0.511

SL	BLDBLK	PS	PT	TT	BETAM	VREL	VM	MREL	VABS	MABS
1	0.990	9.759	14.696	518.7	61.06	1714.0	829.3	1.627	829.3	0.787
2	0.990	9.749	14.696	518.7	60.52	1687.0	830.3	1.601	830.3	0.788
3	0.990	9.748	14.696	518.7	59.97	1659.1	830.4	1.575	830.4	0.788
4	0.990	9.761	14.696	518.7	58.81	1600.9	829.2	1.520	829.2	0.787
5	0.990	9.810	14.696	518.7	57.60	1538.3	824.3	1.459	824.3	0.782
6	0.990	9.914	14.696	518.7	56.36	1469.5	814.0	1.392	814.0	0.771
7	0.990	10.103	14.696	518.7	55.14	1391.7	795.4	1.314	795.4	0.751
8	0.990	10.411	14.696	518.7	54.01	1300.8	764.5	1.223	764.5	0.719
9	0.990	10.822	14.696	518.7	52.81	1194.8	722.2	1.117	722.2	0.675
10	0.990	11.300	14.696	518.7	51.20	1071.5	671.4	0.996	671.4	0.624
11	0.990	11.903	14.696	518.7	48.77	915.6	603.4	0.845	603.4	0.557
12	0.990	12.263	14.696	518.7	46.61	815.7	560.3	0.749	560.3	0.515
13	0.990	12.297	14.696	518.7	40.09	727.0	556.2	0.563	556.2	0.511

STA 11.000 MASS AVERAGED PROPERTIES

PT= 14.696 TT= 518.69 GAMMA=1.4018 PT-RAT= 1.000 TT-RAT= 1.000

RCU= 0. VM= 753.8 CZ= 739.8 MM=0.709 MABS=0.709 MREL=1.259

ROTOR1

WTF= 61.365   I= 8   OPTX=TT   STA= 11.500   AFLOW= 180.37   IN ROTOR   D+C=0.   D+H=0.
                                 MTIP= 92   OPTY=PT   ITYPE=5   INBR=3   ABC=0.   ABH=0.

PSIC	Z	R	PHI	CURV	VM	VREL	BETAM	CU	MREL	ALPHAM	VABS	MM	MABS
0.	-7.963	8.500	0.	0.	850.9	1684.0	59.65	46.8	1.584	3.15	852.1	0.800	0.801
0.050	-7.991	8.323	0.29	0.0273	852.3	1662.6	59.16	41.3	1.567	2.77	853.3	0.803	0.804
0.100	-8.020	8.142	0.65	0.0288	860.0	1641.0	58.39	39.3	1.549	2.61	860.9	0.812	0.813
0.200	-8.083	7.767	1.57	0.0171	872.7	1595.1	56.83	35.5	1.511	2.33	873.4	0.827	0.827
0.300	-8.143	7.372	2.83	0.0088	885.5	1542.6	54.97	37.8	1.464	2.45	886.3	0.840	0.841
0.400	-8.199	6.954	4.58	-0.0092	889.1	1481.5	53.12	42.1	1.406	2.71	890.1	0.844	0.845
0.500	-8.252	6.504	6.79	-0.0167	883.6	1408.2	51.14	51.2	1.334	3.32	885.1	0.837	0.838
0.600	-8.301	6.012	9.41	-0.0017	861.2	1323.0	49.39	56.6	1.249	3.76	863.1	0.813	0.815
0.700	-8.324	5.460	12.60	0.0038	825.3	1224.8	47.64	58.5	1.151	4.06	827.3	0.775	0.777
0.800	-8.299	4.823	16.67	0.0104	781.9	1110.4	45.24	62.7	1.037	4.59	784.4	0.730	0.733
0.900	-8.247	4.024	22.01	0.0234	714.5	963.8	42.15	63.4	0.894	5.07	717.3	0.663	0.665
0.950	-8.231	3.503	25.61	0.0582	678.4	875.3	39.19	65.1	0.809	5.48	681.5	0.627	0.630
1.000	-8.224	2.816	28.87	0.0887	658.0	785.0	33.05	68.9	0.725	5.98	651.6	0.607	0.611

SL	BLDBLK	PS	PT	TT
1	0.954	10.149	15.501	530.4
2	0.953	10.074	15.427	528.8
3	0.952	9.973	15.407	528.1
4	0.949	9.797	15.359	526.8
5	0.945	9.691	15.410	526.9
6	0.939	9.698	15.482	527.3
7	0.929	9.854	15.626	528.5
8	0.919	10.123	15.667	528.7
9	0.907	10.476	15.623	528.1
10	0.891	10.899	15.582	527.6
11	0.869	11.470	15.439	526.2
12	0.850	11.750	15.354	525.4
13	0.812	11.850	15.248	524.4

STA 11.500   MASS AVERAGED PROPERTIES

PT= 15.496   TT= 527.54   GAMMA=1.4018   PT-RAT= 1.054   TT-RAT= 1.017
RCU= 300.7   VM= 832.3   CZ= 815.5   MM=0.784   MABS=0.786   MREL=1.275

20

ROTOR1

```
ROTOR1
        I= 9            STA= 12.000
WTF= 61.365  OPTX=TT   MTIP=105   AFLOW= 169.31         IN ROTOR
             OPTY=PT   OPTY=PT    ITYPE=5  INBR=3   D+C=0.    D+H=0.
                                                    ABC=0.    ABH=0.
```

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-7.759	8.500	0.	0.	823.4	100.3	6.95	0.761
0.050	-7.778	8.323	-0.07	0.0311	828.1	98.0	6.75	0.767
0.100	-7.798	8.144	0.19	0.0422	835.2	95.6	6.53	0.775
0.200	-7.844	7.773	1.20	0.0365	854.4	92.2	6.16	0.797
0.300	-7.889	7.385	2.75	0.0026	874.7	96.2	6.27	0.818
0.400	-7.931	6.976	4.73	-0.0098	889.6	107.2	6.87	0.833
0.500	-7.972	6.538	6.95	-0.0023	898.2	122.7	7.78	0.841
0.600	-8.010	6.060	9.35	0.0084	891.6	133.5	8.51	0.834
0.700	-8.024	5.527	12.41	0.0173	873.9	142.6	9.27	0.816
0.800	-7.994	4.914	16.46	0.0133	838.7	148.0	10.01	0.781
0.900	-7.946	4.145	21.69	0.0113	774.4	150.9	11.02	0.717
0.950	-7.936	3.642	24.92	0.0156	730.6	148.4	11.48	0.674
1.000	-7.941	2.968	27.83	0.0240	690.6	150.0	12.26	0.636

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.928	11.145	16.454	543.8	59.53	1623.9	1.501	829.5	0.767
2	0.927	11.097	16.468	542.7	58.87	1601.6	1.483	833.8	0.772
3	0.926	11.010	16.464	541.6	58.10	1580.3	1.466	840.6	0.780
4	0.921	10.782	16.462	539.8	56.27	1538.5	1.434	859.3	0.801
5	0.914	10.609	16.561	539.6	54.07	1490.6	1.394	880.0	0.823
6	0.904	10.564	16.764	540.7	51.64	1433.3	1.343	896.0	0.839
7	0.887	10.605	17.003	542.3	48.94	1367.5	1.281	906.6	0.849
8	0.870	10.714	17.079	542.5	46.39	1292.7	1.210	901.6	0.844
9	0.852	10.885	17.057	541.9	43.62	1207.1	1.127	885.4	0.827
10	0.833	11.154	16.889	540.1	40.61	1104.8	1.029	851.6	0.793
11	0.803	11.615	16.567	537.1	36.86	967.9	0.896	789.0	0.730
12	0.779	11.867	16.292	534.6	34.08	882.1	0.814	745.6	0.688
13	0.734	12.022	15.985	531.8	28.42	785.3	0.723	706.7	0.651

```
        STA  12.000  MASS AVERAGED PROPERTIES
PT= 16.706  TT= 540.35  GAMMA=1.4018  PT-RAT= 1.137  TT-RAT= 1.042
RCU= 735.6  VM= 848.6   CZ= 831.3  MM=0.791  MABS=0.799  MREL=1.229
```

ROTOR1

WTF= 61.365   I=10   STA= 12.500   AFLOW= 160.72   IN ROTOR
              OPTX=TT MTIP=118 OPTY=PT ITYPE=5 INBR=3   D+C=0. D+H=0.
                                                            ABC=0. ABH=0.

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-7.556	8.500	0.	0.	789.4	161.1	11.54	0.716
0.050	-7.565	8.323	-0.22	-0.0065	796.1	164.1	11.65	0.723
0.100	-7.576	8.144	-0.12	0.0067	801.0	165.7	11.69	0.728
0.200	-7.605	7.777	0.83	0.0173	814.5	168.2	11.67	0.743
0.300	-7.635	7.397	2.49	0.0328	835.7	174.6	11.80	0.765
0.400	-7.664	6.998	4.51	0.0381	862.1	185.5	12.14	0.792
0.500	-7.692	6.572	6.72	0.0301	882.0	197.5	12.62	0.813
0.600	-7.719	6.108	9.19	0.0105	889.9	213.1	13.47	0.822
0.700	-7.724	5.592	12.18	0.0092	882.0	230.3	14.63	0.815
0.800	-7.690	5.003	16.10	0.0263	861.9	247.9	16.05	0.795
0.900	-7.645	4.264	21.37	0.0231	808.8	245.5	16.88	0.745
0.950	-7.641	3.778	24.81	-0.0038	768.9	242.8	17.53	0.707
1.000	-7.658	3.117	28.01	-0.0442	709.9	236.5	18.43	0.651

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.903	12.314	17.575	559.0	59.48	1554.3	1.410	805.6	0.731
2	0.903	12.340	17.733	558.9	58.61	1528.3	1.388	812.9	0.738
3	0.902	12.352	17.842	558.4	57.79	1502.7	1.367	817.9	0.744
4	0.897	12.300	18.018	557.2	55.93	1453.8	1.326	831.7	0.759
5	0.888	12.152	18.199	556.7	53.53	1406.0	1.287	853.8	0.782
6	0.876	11.945	18.409	556.9	50.60	1358.1	1.248	881.9	0.811
7	0.856	11.759	18.549	556.9	47.49	1305.3	1.204	903.8	0.833
8	0.837	11.685	18.656	557.0	44.18	1240.8	1.146	915.0	0.845
9	0.817	11.743	18.684	556.6	40.63	1162.0	1.073	911.5	0.842
10	0.794	11.844	18.570	555.2	36.38	1070.5	0.988	896.8	0.828
11	0.759	12.000	17.919	549.5	32.08	954.5	0.879	845.2	0.779
12	0.732	12.124	17.476	545.7	28.86	878.0	0.807	806.3	0.742
13	0.683	12.305	16.873	540.4	23.83	776.1	0.712	748.3	0.687

STA 12.500 MASS AVERAGED PROPERTIES

PT= 18.209 TT= 555.46 GAMMA=1.4017 PT-RAT= 1.239 TT-RAT= 1.071
RCU= 1249.0 VM= 839.3 CZ= 822.0 MM=0.771 MABS=0.794 MREL=1.159

ROTOR1

<pre>
WTF= 61.365   I=11   STA= 13.000   AFLOW= 154.30   D+C=0.   IN ROTOR
                 OPTX=TT   MTIP=131   ITYPE=5 INBR=3 ABC=0.   D+H=0.
                 OPTY=PT   ABH=0.
</pre>

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-7.352	8.500	0.	0.	756.2	216.7	15.99	0.675
0.050	-7.352	8.322	-0.33	0.0240	767.9	220.9	16.05	0.687
0.100	-7.354	8.143	-0.27	0.0176	777.6	223.7	16.05	0.697
0.230	-7.366	7.780	0.52	0.0282	800.2	230.2	16.05	0.720
0.300	-7.381	7.407	2.02	.0322	823.9	236.3	16.00	0.745
0.400	-7.396	7.018	4.00	J.0287	851.1	248.4	16.27	0.773
0.500	-7.412	6.604	6.32	0.0190	871.6	263.0	16.79	0.794
0.600	-7.428	6.154	8.89	0.0250	887.2	281.1	17.58	0.811
0.700	-7.424	5.657	11.94	0.0187	894.5	302.2	18.67	0.820
0.800	-7.385	5.090	15.74	0.0134	887.0	328.5	20.32	0.814
0.900	-7.344	4.380	21.19	-0.0028	837.4	328.1	21.40	0.768
0.950	-7.346	3.915	25.08	-0.0250	802.4	331.6	22.45	0.736
1.000	-7.375	3.272	29.47	-0.1136	729.8	319.9	23.67	0.668

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.885	13.403	18.637	572.9	59.49	1489.5	1.330	786.6	0.702
2	0.885	13.416	18.863	572.8	58.39	1465.0	1.310	799.1	0.715
3	0.884	13.410	19.033	572.3	57.34	1441.1	1.291	809.2	0.725
4	0.879	13.335	19.356	571.4	55.00	1395.0	1.255	832.6	0.749
5	0.871	13.155	19.566	570.2	52.42	1351.0	1.221	857.1	0.775
6	0.358	12.933	19.817	570.0	49.31	1305.5	1.185	886.6	0.805
7	0.837	12.727	19.995	569.8	45.99	1254.6	1.143	910.4	0.830
8	0.817	12.521	20.107	569.6	42.22	1197.9	1.095	930.7	0.851
9	0.795	12.349	20.140	569.0	37.89	1133.4	1.039	944.2	0.866
10	0.769	12.273	20.073	567.9	32.71	1054.2	0.968	945.9	0.868
11	0.734	12.300	19.241	561.0	27.98	948.2	0.870	899.4	0.825
12	0.705	12.327	18.731	556.9	24.12	879.1	0.806	868.2	0.796
13	0.652	12.529	17.850	549.5	19.43	773.9	0.708	796.8	0.729

STA 13.000 MASS AVERAGED PROPERTIES

PT= 19.562 TT= 568.33 GAMMA=1.4016 PT-RAT= 1.331 TT-RAT= 1.096
RCU= 1686.7 VM= 838.3 CZ= 820.8 MM=0.762 MABS=0.802 MREL=1.110

RW CR1

IN ROTOR

WTF= 61.365   I=12   STA= 13.500   AFLOW= 150.60   D*C=0.   D*H=0.
              OPTX=TT   MTIP=144   ITYPE=5   INBR=3   ABC=0.   ABH=0.
              OPTY=PT

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-7.148	8.500	0.	0.	716.2	261.1	20.03	0.631
0.050	-7.139	8.320	-0.37	-0.0169	734.5	273.3	20.41	0.648
0.100	-7.132	8.142	-0.35	-0.0046	746.3	281.0	20.63	0.659
0.200	-7.127	7.782	0.27	0.0082	767.7	289.6	20.67	0.681
0.300	-7.127	7.415	1.63	0.0212	795.1	300.7	20.72	0.708
0.400	-7.129	7.035	3.60	0.0237	821.2	312.1	20.81	0.735
0.500	-7.132	6.634	5.91	0.0327	843.4	324.3	21.03	0.759
0.600	-7.137	6.199	8.55	0.0161	863.5	343.3	21.68	0.780
0.700	-7.124	5.719	11.69	0.0098	874.7	368.5	22.84	0.793
0.800	-7.081	5.175	15.63	-0.0019	872.8	397.4	24.48	0.794
0.900	-7.043	4.497	21.44	-0.0246	841.0	414.1	26.21	0.767
0.950	-7.051	4.054	25.71	-0.0422	812.3	416.6	27.15	0.741
1.000	-7.092	3.439	31.60	-0.1063	754.3	404.2	28.18	0.689

SL	BLDBLK	PS	PT	PHI	TT	BETAM	VREL	MREL	VABS	MABS
1	0.880	14.418	19.512	0.	584.0	59.97	1431.0	1.261	762.3	0.672
2	0.881	14.486	19.942	-0.37	585.6	58.42	1402.6	1.237	783.7	0.691
3	0.880	14.544	20.255	-0.35	586.0	57.15	1375.7	1.215	797.4	0.704
4	0.874	14.550	20.697	0.27	585.0	54.68	1328.0	1.177	820.5	0.727
5	0.866	14.404	21.066	1.63	584.3	51.73	1283.6	1.143	850.1	0.757
6	0.854	14.172	21.320	3.60	583.3	48.54	1240.2	1.110	878.5	0.786
7	0.833	13.878	21.433	5.91	582.0	45.10	1194.9	1.075	903.7	0.813
8	0.813	13.563	21.524	8.55	581.3	41.00	1144.1	1.034	929.2	0.839
9	0.790	13.304	21.585	11.69	580.7	36.23	1084.4	0.983	949.2	0.861
10	0.764	13.080	21.481	15.63	579.2	30.59	1013.8	0.922	959.0	0.872
11	0.729	12.874	20.756	21.44	573.5	24.29	922.7	0.841	937.5	0.855
12	0.700	12.735	20.084	25.71	568.4	20.20	865.6	0.790	912.9	0.833
13	0.646	12.676	18.981	31.60	559.6	15.04	781.1	0.713	855.8	0.781

STA   13.500   MASS AVERAGED PROPERTIES

PT= 20.943   TT= 580.83   GAMMA=1.4015   PT-RAT= 1.425   TT-RAT= 1.120
RCU= 2111.9   VM= 817.0   CZ= 799.2   MM=0.734   MABS=0.795   MREL=1.049

ROTOR1

```
                          STA= 14.000   AFLOW= 148.19              IN ROTOR
            I=13          MTIP=157       ITYPE=5 INBR=3   D*C=O.    D*H=O.
WTF= 61.365 OPTX=TT       OPTY=PT                         ABC=O.   ABH=O.
```

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-6.945	8.500	0.	0.	683.3	304.4	24.01	0.595
0.050	-6.926	8.319	-0.13	-0.0218	702.1	317.9	24.36	0.612
0.100	-6.910	8.140	-0.19	-0.0212	715.5	328.7	24.67	0.625
0.200	-6.889	7.782	0.24	-0.0037	740.1	342.1	24.80	0.648
0.300	-6.873	7.421	1.44	0.0047	770.2	356.4	24.83	0.678
0.400	-6.861	7.051	3.27	0.0186	798.1	369.3	24.83	0.706
0.500	-6.852	6.662	5.52	0.0153	819.5	382.2	25.00	0.729
0.600	-6.846	6.242	8.31	0.0124	838.0	401.4	25.59	0.749
0.700	-6.824	5.781	11.59	0.0016	849.0	425.2	26.60	0.762
0.800	-6.776	5.260	15.80	-0.0171	851.6	459.5	28.35	0.768
0.900	-6.742	4.617	22.06	-0.0424	833.0	491.0	30.52	0.754
0.950	-6.756	4.199	26.68	-0.0608	813.4	501.0	31.63	0.738
1.000	-6.809	3.620	33.50	-0.0911	775.9	492.0	32.38	0.707

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.881	15.326	20.386	594.8	60.25	1377.1	1.199	748.0	0.651
2	0.881	15.432	20.889	596.5	58.60	1347.5	1.175	770.7	0.672
3	0.880	15.533	21.308	597.4	57.14	1318.8	1.151	787.4	0.687
4	0.875	15.602	21.928	597.0	54.34	1269.4	1.112	815.3	0.714
5	0.867	15.480	22.425	596.5	51.06	1225.5	1.079	848.7	0.747
6	0.856	15.237	22.742	595.3	47.63	1184.3	1.048	879.4	0.778
7	0.837	14.930	22.864	593.6	44.07	1140.6	1.015	904.3	0.804
8	0.818	14.584	22.932	592.4	39.88	1091.9	0.976	929.2	0.830
9	0.797	14.248	22.917	591.0	35.02	1036.8	0.931	949.5	0.852
10	0.773	13.924	22.864	589.8	28.84	972.1	0.876	967.5	0.872
11	0.740	13.519	22.274	585.4	21.24	893.7	0.809	967.0	0.875
12	0.712	13.220	21.595	580.6	16.44	848.0	0.770	955.3	0.867
13	0.661	12.840	20.328	571.1	10.71	789.7	0.719	918.7	0.837

```
        STA  14.000  MASS AVERAGED PROPERTIES
PT= 22.269  TT= 592.27  GAMMA=1.4014  PT-RAT= 1.515  TT-RAT= 1.142
RCU= 2501.1  VM= 795.1  CZ= 776.6  MM=0.708  MABS=0.791  MREL=0.996
```

ROTOR1

WTF= 61.365

			STA= 14.500	AFLOW= 147.21		D*C=0.	IN ROTOR
I=14			MTIP=170	ITYPE=5	INBR=3	ABC=0.	D*H=0.
OPTX=TT			OPTY=PT				ABH=0.

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-6.741	8.500	0.	0.	649.1	373.3	29.90	0.557
0.050	-6.712	8.319	-0.08	0.0136	663.4	383.0	30.00	0.570
0.100	-6.688	8.140	-0.12	0.0108	676.5	391.5	30.06	0.582
0.200	-6.650	7.784	0.30	-0.0050	704.3	403.3	29.79	0.609
0.300	-6.619	7.428	1.46	-0.0075	737.4	417.5	29.52	0.641
0.400	-6.594	7.066	3.16	-0.0037	765.9	430.7	29.35	0.670
0.500	-6.572	6.688	5.47	-0.0086	783.5	442.8	29.47	0.689
0.600	-6.555	6.284	8.23	-0.0028	798.6	462.1	30.06	0.705
0.700	-6.524	5.842	11.64	-0.0083	807.9	484.8	30.97	0.717
0.800	-6.472	5.348	16.18	-0.0245	813.7	519.4	32.55	0.726
0.900	-6.441	4.742	22.90	-0.0480	811.6	567.1	34.95	0.728
0.950	-6.461	4.351	27.94	-0.0717	802.7	586.0	36.13	0.724
1.000	-6.526	3.813	35.16	-0.0779	787.7	590.2	36.84	0.715

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.888	16.535	21.824	612.0	60.05	1300.3	1.115	748.8	0.642
2	0.888	16.686	22.319	612.4	58.56	1271.8	1.093	766.0	0.658
3	0.887	16.793	22.744	612.4	57.08	1244.9	1.071	781.6	0.673
4	0.882	16.857	23.424	611.0	54.03	1199.0	1.037	811.6	0.702
5	0.876	16.717	23.983	609.9	50.46	1158.3	1.007	847.4	0.737
6	0.866	16.466	24.341	608.2	46.82	1119.3	0.979	878.7	0.768
7	0.850	16.174	24.441	605.8	43.27	1076.0	0.946	900.0	0.791
8	0.834	15.823	24.484	604.1	39.01	1027.7	0.907	922.6	0.815
9	0.816	15.432	24.402	602.0	34.06	975.2	0.865	942.2	0.836
10	0.797	14.981	24.309	600.4	27.54	917.7	0.818	965.4	0.861
11	0.767	14.323	23.938	597.8	18.38	855.2	0.768	990.1	0.889
12	0.741	13.832	23.304	593.7	12.77	823.0	0.742	993.8	0.896
13	0.695	13.109	22.032	584.9	6.00	792.0	0.719	984.2	0.894

STA 14.500 MASS AVERAGED PROPERTIES

PT= 23.808 TT= 605.13 GAMMA=1.4012 PT-RAT= 1.620 TT-RAT= 1.167
RCU= 2939.0 VM= 762.0 CZ= 742.7 MM=0.670 MABS=0.784 MREL=0.931

ROTOR1

STA= 15.000   IN ROTOR

WTF= 61.365   I=15   MTIP=183   AFLOW= 146.82   D+C=0.   D+H=0.

       OPTX=TT OPTY=PT ITYPE=5 INBR=3 ABC=0. ABH=0.

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-6.538	8.500	0.	0.	604.5	469.5	37.84	0.509
0.050	-6.499	8.318	-0.41	0.0401	620.0	473.2	37.35	0.523
0.100	-6.466	8.139	-0.49	0.0461	634.0	474.4	36.81	0.537
0.200	-6.411	7.785	0.18	0.0226	667.8	475.4	35.45	0.570
0.300	-6.365	7.434	1.56	-0.0060	703.8	480.9	34.34	0.605
0.400	-6.326	7.081	3.37	-0.0241	732.5	489.9	33.78	0.633
0.500	-6.293	6.715	5.69	-0.0188	751.7	502.9	33.79	0.654
0.600	-6.263	6.326	8.43	-0.0216	764.2	519.9	34.22	0.668
0.700	-6.224	5.905	11.95	-0.0260	773.0	544.3	35.15	0.679
0.800	-6.168	5.437	16.68	-0.0309	781.9	580.4	36.59	0.691
0.900	-6.140	4.872	23.77	-0.0438	793.3	641.5	38.96	0.707
0.950	-6.166	4.512	29.01	-0.0398	802.4	674.5	40.05	0.720
1.000	-6.243	4.018	36.58	-0.0625	807.5	711.7	41.39	0.732

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.899	18.098	23.926	636.0	59.60	1194.7	1.006	765.4	0.644
2	0.899	18.231	24.392	634.4	58.06	1172.2	0.990	780.0	0.658
3	0.898	18.292	24.729	632.2	56.61	1152.0	0.976	791.8	0.671
4	0.894	18.226	25.270	627.5	53.38	1119.4	0.955	819.7	0.699
5	0.889	17.968	25.674	623.8	49.74	1089.0	0.936	852.4	0.732
6	0.882	17.668	25.962	620.7	46.04	1055.3	0.913	881.3	0.762
7	0.869	17.342	26.091	618.0	42.22	1015.0	0.883	904.4	0.786
8	0.857	16.952	26.052	615.4	37.97	969.5	0.847	924.3	0.808
9	0.844	16.524	25.983	613.2	32.78	919.4	0.808	945.4	0.831
10	0.830	15.963	25.891	611.5	25.86	869.0	0.768	973.8	0.860
11	0.807	15.072	25.746	610.6	15.38	822.8	0.733	1020.2	0.909
12	0.785	14.306	25.305	608.2	8.62	811.6	0.728	1048.3	0.940
13	0.741	13.250	24.388	602.8	-0.19	807.5	0.732	1076.4	0.975

STA 15.000 TT= 619.32 VM= 731.0 CZ= 710.6

STA 15.000 MASS AVERAGED PROPERTIES

PT= 25.566 TT= 619.32 GAMMA=1.4010 PT-RAT= 1.740 TT-RAT= 1.194

RCU= 3422.3 VM= 731.0 CZ= 710.6 MM=0.636 MABS=0.787 MREL=0.868

ROTOR1

```
WTF= 61.365        I=16      STA= 15.500    AFLOW= 147.10      IN ROTOR
                 OPTX=TT     MTIP=196       ITYPE=5  INBR=3    D*C=0.   D*H=0.
                 OPTY=PT                                       ABC=0.   ABH=0.
```

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-6.334	8.500	0.	0.	564.4	536.6	43.55	0.469
0.050	-6.286	8.316	-0.85	0.0321	588.0	538.6	42.49	0.491
0.100	-6.244	8.136	-0.92	0.0225	606.7	537.9	41.56	0.508
0.200	-6.172	7.785	0.13	-0.0146	644.4	537.2	39.82	0.544
0.300	-6.111	7.442	1.91	-0.0424	679.0	540.9	38.54	0.578
0.400	-6.058	7.098	3.97	-0.0533	705.3	547.4	37.82	0.604
0.500	-6.012	6.744	6.30	-0.0565	720.9	559.4	37.81	0.621
0.600	-5.972	6.371	9.09	-0.0561	728.0	575.6	38.33	0.630
0.700	-5.924	5.970	12.58	-0.0463	735.6	600.6	39.23	0.640
0.800	-5.863	5.530	17.33	-0.0397	747.3	634.7	40.34	0.655
0.900	-5.838	5.007	24.34	-0.0168	773.3	698.3	42.08	0.684
0.950	-5.871	4.678	29.64	-0.0252	793.0	740.9	43.05	0.707
1.000	-5.960	4.231	37.01	0.0200	834.6	800.7	43.81	0.756

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.913	19.207	25.455	652.7	59.64	1116.6	0.928	778.7	0.647
2	0.913	19.288	25.960	650.3	57.67	1099.4	0.918	797.4	0.666
3	0.912	19.317	26.313	647.3	55.96	1083.6	0.908	810.8	0.679
4	0.910	19.256	26.920	641.6	52.40	1056.0	0.892	838.9	0.709
5	0.907	19.030	27.352	637.0	48.68	1028.4	0.875	868.1	0.739
6	0.903	18.743	27.615	632.9	45.00	997.3	0.855	892.8	0.765
7	0.896	18.437	27.730	629.6	41.18	957.9	0.825	912.5	0.786
8	0.889	18.077	27.659	626.5	37.00	911.6	0.789	928.1	0.804
9	0.882	17.619	27.589	624.1	31.62	863.8	0.752	949.6	0.826
10	0.874	16.944	27.438	621.9	24.54	821.5	0.720	980.5	0.859
11	0.861	15.788	27.361	621.5	13.47	795.2	0.704	1042.0	0.922
12	0.842	14.853	27.110	620.6	6.10	797.5	0.711	1085.2	0.968
13	0.799	13.261	26.567	618.3	-3.71	836.3	0.757	1156.6	1.047

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            STA  15.500   MASS AVERAGED PROPERTIES
PT= 27.206  TT= 631.84  GAMMA=1.4008  PT-RAT= 1.851  TT-RAT= 1.218
RCU= 3849.2  VM= 703.6  CZ= 682.3  MM=0.607  MABS=0.793  MREL=0.815
```

ROTOR1   STA= 16.000   TE ROTOR

WTF= 61.365   I=17   MTIP=209   AFLOW= 148.34   D+C=0.   D+H=0.

OPTX=TT   ITYPE=6   INBR=3   ABC=0.   ABH=0.

OPTY=PT

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-6.131	8.500	0.	0.	526.5	583.6	47.94	0.434
0.050	-6.073	8.312	-0.71	-0.0556	562.6	585.7	46.15	0.466
0.100	-6.021	8.133	-0.53	-0.0836	586.7	586.4	44.99	0.488
0.200	-5.933	7.787	0.93	-0.1020	628.3	590.1	43.20	0.527
0.300	-5.857	7.452	2.93	-0.0982	657.5	595.1	42.15	0.555
0.400	-5.791	7.119	5.04	-0.0861	678.2	602.3	41.61	0.576
0.500	-5.732	6.778	7.32	-0.0708	687.7	613.0	41.71	0.587
0.600	-5.681	6.420	9.98	-0.0439	692.2	630.7	42.34	0.594
0.700	-5.624	6.039	13.21	-0.0255	698.6	655.8	43.19	0.603
0.800	-5.559	5.627	17.48	0.0231	713.0	691.1	44.11	0.619
0.900	-5.537	5.143	23.72	0.0819	734.1	746.8	45.49	0.644
0.950	-5.576	4.845	28.22	0.1715	761.8	792.0	46.11	0.674
1.000	-5.677	4.440	35.78	0.1021	780.4	870.4	48.12	0.699

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.926	20.036	26.560	664.4	60.12	1056.9	0.871	786.0	0.648
2	0.927	20.030	27.120	661.7	57.45	1045.5	0.866	812.1	0.673
3	0.927	20.047	27.560	658.8	55.34	1031.8	0.858	829.5	0.690
4	0.927	20.050	28.390	653.7	51.29	1004.7	0.842	862.0	0.723
5	0.928	19.948	28.940	649.0	47.59	975.0	0.823	886.8	0.749
6	0.928	19.765	29.280	644.7	43.95	942.1	0.800	907.1	0.771
7	0.928	19.522	29.380	640.8	40.29	901.6	0.770	921.3	0.787
8	0.928	19.181	29.350	637.7	35.96	855.1	0.734	936.4	0.804
9	0.928	18.695	29.280	635.1	30.40	809.9	0.699	958.2	0.827
10	0.928	17.937	29.160	633.0	22.95	774.2	0.673	992.9	0.863
11	0.928	16.748	28.920	631.6	12.35	751.5	0.659	1047.2	0.919
12	0.914	15.683	28.770	631.5	4.72	764.4	0.676	1099.0	0.972
13	0.875	14.311	28.650	632.3	-6.35	785.2	0.703	1169.0	1.047

STA 16.000   MASS AVERAGED PROPERTIES

PT= 28.783   TT= 643.26   GAMMA=1.4006   PT-RAT= 1.4006   PT-RAT= 1.959   TT-RAT= 1.240

RCU= 4238.7   VM= 673.5   CZ= 653.5   MM=0.576   MABS=0.797   MREL=0.764

AVERAGE PCT IMM	RAD	BLADE SPEED IN	OUT	ACC PT RATIO	ACC TT RATIO	EFFICIENCY AD.	POLY	AXIAL VEL R
0.	8.500	1500.0	1500.0	1.8073	1.2809	0.656	0.683	0.635
3.7	8.317	1468.5	1466.9	1.8454	1.2757	0.694	0.719	0.678
7.4	8.136	1436.3	1435.2	1.8753	1.2701	0.729	0.752	0.707
14.7	7.773	1369.4	1374.1	1.9318	1.2603	0.796	0.814	0.758
22.1	7.406	1298.8	1315.0	1.9692	1.2512	0.851	0.864	0.798
29.8	7.026	1223.4	1256.2	1.9924	1.2429	0.897	0.906	0.832
37.9	6.624	1142.0	1196.0	1.9992	1.2354	0.930	0.937	0.863
46.6	6.192	1052.5	1132.9	1.9971	1.2294	0.953	0.957	0.903
56.2	5.716	951.8	1065.6	1.9924	1.2244	0.971	0.973	0.963
67.0	5.180	835.1	992.9	1.9842	1.2204	0.982	0.984	1.055
80.3	4.523	688.6	907.6	1.9679	1.2177	0.981	0.983	1.198
88.8	4.102	592.8	855.0	1.9577	1.2175	0.974	0.976	1.329
100.0	3.547	468.2	783.6	1.9495	1.2190	0.960	0.964	1.330

FREE

WTF= 61.365

I=18
OPTX=DPP

STA= 17.000
MTIP=222
OPTY=FREE

AFLOW= 146.22
ITYPE=0 INBR=0

D+C=0. INBR=0 ABC=0.

D+H=0.
ABH=0.

FREE

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-5.700	8.500	0.	0.	508.2	583.6	48.95	0.418
0.050	-5.639	8.312	0.69	-0.0570	557.9	585.7	46.39	0.462
0.100	-5.586	8.136	1.47	-0.0770	591.6	586.2	44.73	0.492
0.200	-5.498	7.803	3.14	-0.0752	646.0	588.9	42.35	0.542
0.300	-5.428	7.482	4.82	-0.0545	678.6	592.7	41.13	0.574
0.400	-5.373	7.162	6.49	-0.0347	700.5	598.7	40.52	0.596
0.500	-5.331	6.834	8.31	-0.0140	712.0	608.0	40.49	0.609
0.600	-5.304	6.489	10.43	0.0074	717.8	624.0	41.00	0.617
0.700	-5.294	6.117	13.13	0.0343	723.5	647.4	41.82	0.625
0.800	-5.304	5.706	16.80	0.0658	727.7	681.5	43.13	0.633
0.900	-5.351	5.223	22.46	0.1364	735.0	735.4	45.01	0.644
0.950	-5.405	4.933	26.15	0.2054	748.3	777.9	46.11	0.660
1.000	-5.521	4.549	34.04	0.2237	733.7	849.5	49.18	0.651

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.940	20.197	26.533	664.4	60.99	1047.9	0.862	773.8	0.637
2	0.940	20.061	27.093	661.7	57.66	1043.0	0.863	808.8	0.670
3	0.940	19.974	27.532	658.8	55.15	1035.3	0.861	832.8	0.693
4	0.940	19.843	28.390	653.7	50.66	1019.0	0.856	874.2	0.734
5	0.940	19.698	28.940	649.0	47.00	995.0	0.842	901.0	0.762
6	0.940	19.503	29.280	644.7	43.52	966.0	0.822	921.5	0.784
7	0.940	19.246	29.380	640.8	40.03	929.9	0.796	936.3	0.801
8	0.940	18.908	29.350	637.7	35.97	887.0	0.763	951.1	0.818
9	0.940	18.458	29.280	635.1	30.85	842.7	0.728	970.9	0.839
10	0.940	17.861	29.160	633.0	24.09	797.1	0.693	997.0	0.867
11	0.940	16.889	28.920	631.6	14.22	758.3	0.664	1039.8	0.911
12	0.940	16.053	28.770	631.5	7.06	754.0	0.665	1079.4	0.952
13	0.940	15.142	28.564	632.3	-3.64	735.2	0.653	1122.5	0.997

STA 17.000 MASS AVERAGED PROPERTIES

PT= 28.777 TT= 643.26 GAMMA=1.4006 PT-RAT= 1.958 TT-RAT= 1.240
RCU= 4238.7 VM= 686.5 CZ= 667.6 MM=0.588 MABS=0.803 MREL=0.779

STATOR

WTF= 61.365   I=19   OPTX=DPP   STA= 18.000   MTIP=235   AFLOW= 141.53   D+C=0.   LE STATOR   D+H=0.

OPTY=FREE   ITYPE=1   INBR=4   ABC=0.   ABH=0.

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-5.250	8.500	0.	0.	549.4	583.6	46.73	0.453
0.050	-5.192	8.323	1.49	-0.0056	589.2	584.9	44.79	0.489
0.100	-5.143	8.154	2.60	-0.0121	619.3	584.9	43.36	0.516
0.200	-5.062	7.833	4.32	-0.0191	672.1	586.6	41.12	0.566
0.300	-5.003	7.522	5.73	-0.0201	705.7	589.5	39.88	0.598
0.400	-4.961	7.212	7.13	-0.0189	729.1	594.5	39.20	0.622
0.500	-4.937	6.893	8.65	-0.0161	742.9	602.8	39.06	0.638
0.600	-4.933	6.557	10.49	-0.0121	751.9	617.5	39.40	0.649
0.700	-4.953	6.195	12.85	-0.0065	760.9	639.3	40.03	0.660
0.800	-5.004	5.794	16.12	0.0101	769.2	671.2	41.11	0.671
0.900	-5.108	5.319	21.21	0.0303	773.7	722.1	43.03	0.680
0.950	-5.202	5.028	24.67	0.0235	759.5	763.2	45.14	0.670
1.000	-5.375	4.643	31.23	0.3397	803.8	832.3	46.00	0.718

SL	BLDBLK	PS	PT	TT	BETAM	VREL	VABS	MREL	MABS
1	0.940	19.783	26.533	664.4	-59.06	1068.5	801.5	0.882	0.662
2	0.940	19.725	27.093	661.7	56.31	1062.2	830.3	0.881	0.689
3	0.940	19.666	27.532	658.8	54.05	1055.0	851.8	0.880	0.710
4	0.940	19.534	28.390	653.7	49.81	1041.5	892.1	0.876	0.751
5	0.940	19.368	28.940	649.0	46.28	1021.1	919.5	0.866	0.780
6	0.940	19.150	29.280	644.7	42.93	995.7	940.8	0.850	0.803
7	0.940	18.868	29.380	640.8	39.56	963.5	956.6	0.827	0.821
8	0.940	18.500	29.350	637.7	35.67	925.5	972.9	0.798	0.839
9	0.940	18.026	29.280	635.1	30.82	886.1	993.8	0.768	0.862
10	0.940	17.409	29.160	633.0	24.54	845.6	1020.9	0.738	0.891
11	0.940	16.538	28.920	631.6	15.64	803.4	1058.3	0.706	0.930
12	0.940	16.104	28.770	631.5	9.29	769.5	1076.7	0.678	0.949
13	0.940	14.493	28.564	632.3	-0.92	803.9	1157.1	0.718	1.034

STA 18.000 MASS AVERAGED PROPERTIES

PT= 28.777 TT= 643.26 GAMMA=1.4007 PT-RAT= 1.958 TT-RAT= 1.240

RCU= 4238.7 VM= 718.9 CZ= 700.4 MM=0.617 MABS=0.822 MREL=0.809

STATOR

WTF= 61.365   I=20   OPTX=DPP   MTIP=248   OPTY=BETM   ITYPE=2   INBR=4   D*C=0. ABC=0.   D*H=0. ABH=0.

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.0	-4.770	8.500	0.	0.	613.2	374.6	31.42	0.502
0.050	-4.723	8.335	1.13	0.0323	642.2	383.7	30.86	0.528
0.100	-4.683	8.175	2.08	0.0519	665.8	390.3	30.38	0.550
0.200	-4.616	7.867	3.67	0.0696	711.1	405.5	29.69	0.593
0.300	-4.566	7.566	5.09	0.0712	743.3	416.9	29.29	0.625
0.400	-4.531	7.266	6.53	0.0668	767.5	427.8	29.13	0.650
0.500	-4.512	6.958	8.13	0.0581	783.8	438.4	29.22	0.667
0.600	-4.508	6.635	10.02	0.0500	798.0	451.5	29.50	0.683
0.700	-4.524	6.292	12.32	0.0486	815.5	471.7	30.05	0.702
0.800	-4.565	5.918	15.30	0.0529	838.4	502.4	30.93	0.727
0.900	-4.641	5.494	19.49	0.0898	871.3	545.5	32.05	0.762
0.950	-4.696	5.253	22.43	0.1182	897.8	574.4	32.61	0.790
1.000	-4.770	4.975	26.23	0.1265	931.4	614.0	33.40	0.826

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.875	20.999	26.533	664.4	61.42	1281.6	1.049	718.6	0.588
2	0.877	20.985	27.093	661.7	59.43	1262.6	1.039	748.1	0.615
3	0.878	20.939	27.532	658.8	57.68	1245.2	1.029	771.8	0.638
4	0.879	20.779	28.390	653.7	54.11	1213.1	1.012	818.6	0.683
5	0.880	20.554	28.940	649.0	51.01	1181.5	0.993	852.2	0.717
6	0.881	20.276	29.280	644.7	48.07	1148.5	0.972	878.7	0.744
7	0.880	19.946	29.380	640.8	45.20	1112.4	0.947	898.1	0.765
8	0.880	19.541	29.350	637.7	42.04	1074.4	0.920	916.9	0.785
9	0.878	18.994	29.280	635.1	38.07	1035.8	0.892	942.1	0.811
10	0.875	18.229	29.160	633.0	32.88	998.4	0.865	977.4	0.847
11	0.867	17.111	28.920	631.6	25.95	969.0	0.847	1028.0	0.899
12	0.857	16.309	28.770	631.5	21.44	964.5	0.849	1065.8	0.938
13	0.837	15.272	28.564	632.3	15.82	968.0	0.858	1115.6	0.989

STA 19.000 MASS AVERAGED PROPERTIES

PT= 28.777 TT= 643.26 GAMMA=1.4005 PT-RAT= 1.958 TT-RAT= 1.240
RCU= 3074.8 VM= 776.7 CZ= 759.2 MM=0.662 MABS=0.767 MREL=0.943

STATOR

WTF= 61.365

I=21
OPTX=DPP

STA= 20.000
MTIP=261
OPTY=BETM

AFLOW= 118.85
ITYPE=2
INBR=4

IN STATOR
D+H=0.
ABH=0.
D+C=0.
ABC=0.

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-4.300	8.500	0.	0.	653.9	261.9	21.82	0.535
0.050	-4.277	8.341	0.66	0.0048	683.9	271.4	21.64	0.562
0.100	-4.257	8.186	1.32	0.0100	706.3	278.0	21.49	0.583
0.200	-4.225	7.887	2.67	0.0191	747.7	290.6	21.24	0.623
0.300	-4.200	7.595	4.07	0.0257	774.5	297.8	21.03	0.649
0.400	-4.184	7.302	5.55	0.0310	793.4	303.0	20.90	0.669
0.500	-4.174	7.003	7.20	0.0377	804.5	306.6	20.86	0.682
0.600	-4.173	6.692	9.07	0.0466	814.1	311.3	20.93	0.693
0.700	-4.180	6.364	11.26	0.0569	827.1	319.9	21.15	0.707
0.800	-4.199	6.014	13.92	0.0742	846.0	334.8	21.59	0.726
0.900	-4.233	5.630	17.34	0.0846	871.4	355.7	22.20	0.752
0.950	-4.261	5.419	19.54	0.0976	889.0	368.6	22.52	0.770
1.000	-4.300	5.188	22.50	0.1259	911.2	385.1	22.91	0.792

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.849	21.198	26.533	664.4	62.16	1400.2	1.144	704.4	0.576
2	0.851	21.168	27.093	661.7	60.33	1381.7	1.135	735.8	0.605
3	0.852	21.134	27.532	658.8	58.81	1363.8	1.126	759.1	0.627
4	0.855	21.050	28.390	653.7	55.83	1331.1	1.108	802.2	0.668
5	0.857	20.940	28.940	649.0	53.39	1298.7	1.089	829.8	0.696
6	0.859	20.798	29.280	644.7	51.17	1265.2	1.067	849.3	0.716
7	0.860	20.615	29.380	640.8	49.11	1229.1	1.042	861.0	0.730
8	0.860	20.366	29.350	637.7	46.89	1191.2	1.014	871.6	0.742
9	0.858	20.010	29.280	635.1	44.16	1152.9	0.985	886.8	0.758
10	0.855	19.485	29.160	633.0	40.66	1115.2	0.958	909.8	0.781
11	0.847	18.729	28.920	631.6	36.21	1080.0	0.932	941.2	0.813
12	0.840	18.242	28.770	631.5	33.47	1065.7	0.923	962.3	0.833
13	0.828	17.629	28.564	632.3	30.20	1054.3	0.916	989.2	0.860

STA 20.000 MASS AVERAGED PROPERTIES
PT= 28.777 TT= 643.26 GAMMA=1.4003 PT-RAT= 1.958 TT-RAT= 1.240
RCU= 2144.2 VM= 796.8 CZ= 783.2 MM=0.675 MABS=0.725 MREL=1.035

STATOR

WTF= 61.365   I=22   STA= 21.000   AFLOW= 115.13   IN STATOR
                       MTIP=274
               OPTX=DPP OPTY=BETM ITYPE=2 INBR=4   D*C=O.   D*C=O.   D*H=O.
                                                       ABC=O.   ABH=O.

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-3.800	8.500	0.	0.	671.5	169.9	14.20	0.548
0.050	-3.800	8.346	0.55	0.0031	702.6	175.4	14.02	0.577
0.100	-3.800	8.196	1.12	0.0054	725.5	179.0	13.86	0.598
0.200	-3.800	7.905	2.31	0.0107	767.4	185.6	13.59	0.638
0.300	-3.800	7.621	3.57	0.0176	793.6	189.3	13.41	0.664
0.400	-3.800	7.337	4.93	0.0256	811.4	191.6	13.29	0.683
0.500	-3.800	7.047	6.41	0.0350	821.3	192.8	13.21	0.695
0.600	-3.800	6.748	8.08	0.0458	829.1	193.8	13.16	0.704
0.700	-3.800	6.436	9.99	0.0580	839.0	196.9	13.20	0.715
0.800	-3.800	6.107	12.20	0.0722	851.7	203.6	13.44	0.728
0.900	-3.800	5.756	14.98	0.0984	868.5	213.2	13.79	0.745
0.950	-3.800	5.570	16.64	0.1118	881.3	218.1	13.90	0.758
1.000	-3.800	5.376	18.63	0.1266	896.0	223.0	13.98	0.771

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.849	21.361	26.533	664.4	63.21	1490.0	1.217	692.7	0.566
2	0.850	21.338	27.093	661.7	61.56	1475.4	1.211	724.2	0.594
3	0.851	21.313	27.532	658.8	60.21	1460.3	1.204	747.3	0.616
4	0.853	21.256	28.390	653.7	57.61	1432.4	1.191	789.5	0.657
5	0.855	21.178	28.940	649.0	55.52	1401.9	1.174	815.8	0.683
6	0.856	21.070	29.280	644.7	53.66	1369.4	1.153	833.7	0.702
7	0.858	20.924	29.380	640.8	51.99	1333.7	1.128	843.6	0.713
8	0.858	20.727	29.350	637.7	50.26	1296.7	1.101	851.4	0.723
9	0.859	20.461	29.280	635.1	48.21	1259.1	1.073	861.8	0.734
10	0.858	20.101	29.160	633.0	45.74	1220.5	1.043	875.7	0.749
11	0.855	19.585	28.920	631.6	42.74	1182.5	1.015	894.3	0.767
12	0.854	19.238	28.770	631.5	40.96	1166.9	1.003	907.9	0.780
13	0.852	18.831	28.564	632.3	39.00	1153.0	0.992	923.4	0.795

STA 21.000 MASS AVERAGED PROPERTIES

PT= 28.777 TT= 643.26 GAMMA=1.4003 PT-RAT= 1.958 TT-RAT= 1.240
RCU= 1351.3 VM= 809.3 CZ= 799.0 MM=0.683 MABS=0.703 MREL=1.119

STATOR

WTF= 61.365   I=23   STA= 22.000   AFLOW= 114.72   IN STATOR
OPTX=DPP   MTIP=287
OPTY=BETM   ITYPE=2   INBR=4

D*C=O.   D*H=O.
ABC=O.   ABH=O.

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-3.204	8.500	0.	0.	663.2	83.7	7.19	0.540
0.050	-3.211	8.351	0.55	-0.0031	695.0	86.3	7.08	0.569
0.100	-3.218	8.207	1.05	-0.0015	717.9	87.8	6.97	0.591
0.200	-3.232	7.927	2.02	0.0069	760.1	90.6	6.79	0.630
0.300	-3.246	7.653	3.04	0.0159	786.4	91.8	6.66	0.657
0.400	-3.259	7.380	4.15	0.0247	804.3	92.5	6.56	0.675
0.500	-3.272	7.102	5.38	0.0333	813.9	92.5	6.48	0.686
0.600	-3.287	6.815	6.76	0.0432	821.0	92.5	6.43	0.695
0.700	-3.301	6.516	8.35	0.0550	829.9	93.5	6.43	0.705
0.800	-3.316	6.203	10.37	0.0580	840.0	95.8	6.51	0.715
0.900	-3.333	5.870	12.74	0.0644	848.0	98.9	6.65	0.724
0.950	-3.341	5.695	13.99	0.0825	853.7	100.5	6.72	0.729
1.000	-3.350	5.512	15.23	0.1249	863.6	102.5	6.77	0.738

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.880	21.691	26.533	664.4	64.91	1563.9	1.274	658.5	0.545
2	0.880	21.682	27.093	661.7	63.39	1551.8	1.271	700.4	0.573
3	0.881	21.674	27.532	658.8	62.18	1538.2	1.265	723.3	0.595
4	0.882	21.644	28.390	653.7	59.84	1513.1	1.255	765.5	0.635
5	0.883	21.583	28.940	649.0	58.00	1484.2	1.239	791.8	0.661
6	0.883	21.487	29.280	644.7	56.38	1452.8	1.220	809.6	0.680
7	0.884	21.352	29.380	640.8	54.96	1417.7	1.196	819.2	0.691
8	0.885	21.173	29.350	637.7	53.51	1380.7	1.168	826.2	0.699
9	0.886	20.936	29.280	635.1	51.85	1343.4	1.141	835.1	0.709
10	0.886	20.643	29.160	633.0	49.94	1305.1	1.111	845.4	0.720
11	0.886	20.310	28.920	631.6	47.86	1263.8	1.079	853.8	0.729
12	0.887	20.100	28.770	631.5	46.65	1243.7	1.062	859.6	0.734
13	0.887	19.789	28.564	632.3	45.22	1226.0	1.048	869.7	0.743

STA 22.000 MASS AVERAGED PROPERTIES

PT= 28.777 TT= 643.26 GAMMA=1.4002 PT-RAT= 1.958 TT-RAT= 1.240
RCU= 653.6 VM= 798.6 CZ= 791.5 MM=0.672 MABS=0.676 MREL=1.184

STATOR   I=24   STA= 23.000   TE STATOR

WTF= 61.365   OPTX=DPP   MTIP=300   AFLOW= 118.17   D*C=0.   D*H=0.

OPTY=BETM ITYPE=3 NBR=4   ABC=0. ABH=0.

PSIC	Z	R	PHI	CURV	VM	TT	BETAM	CU	ALPHAM	MM MABS
0.	-2.567	8.500	0.	0.	658.1	664.4	66.31	0.	0.	0.536
0.050	-2.581	8.357	0.49	0.0063	685.3	661.7	65.08	0.	0.	0.560
0.100	-2.595	8.218	0.92	0.0091	702.8	658.8	64.14	0.	0.	0.577
0.200	-2.622	7.947	1.69	0.0124	744.8	653.7	62.03	0.	0.	0.616
0.300	-2.648	7.682	2.46	0.0183	770.2	649.0	60.40	0.	0.	0.642
0.400	-2.674	7.418	3.28	0.0267	788.1	644.7	58.95	0.	0.	0.660
0.500	-2.700	7.150	4.21	0.0378	797.4	640.8	57.71	0.	0.	0.671
0.600	-2.728	6.874	5.25	0.0505	803.1	637.7	56.49	0.	0.	0.678
0.700	-2.756	6.587	6.45	0.0655	811.7	635.1	55.08	0.	0.	0.687
0.800	-2.785	6.290	8.02	0.0938	831.4	633.0	53.17	0.	0.	0.707
0.900	-2.816	5.976	9.88	0.1248	831.4	631.6	51.75	0.	0.	0.708
0.950	-2.833	5.809	10.79	0.1318	831.5	631.5	50.95	0.	0.	0.708
1.000	-2.850	5.631	11.52	0.1267	819.9	632.3	50.48	0.	0.	0.697

SL	BLDBLK	PS	PT	VM	VREL	MREL	VABS	MABS
1	0.940	21.480	26.109	658.1	1638.0	1.333	658.1	0.536
2	0.940	21.482	26.581	685.3	1626.3	1.330	685.3	0.560
3	0.940	21.478	26.910	702.8	1611.6	1.323	702.8	0.577
4	0.940	21.461	27.731	744.8	1587.9	1.314	744.8	0.615
5	0.940	21.430	28.269	770.2	1559.2	1.299	770.2	0.642
6	0.940	21.375	28.639	788.1	1528.0	1.280	788.1	0.660
7	0.940	21.285	28.781	797.4	1492.6	1.256	797.4	0.671
8	0.940	21.148	28.769	803.1	1454.8	1.228	803.1	0.678
9	0.940	20.960	28.750	811.7	1417.8	1.200	811.7	0.687
10	0.940	20.669	28.851	831.4	1386.9	1.179	831.4	0.707
11	0.940	20.223	28.250	831.4	1342.9	1.143	831.4	0.708
12	0.940	19.940	27.860	831.5	1319.9	1.124	831.5	0.708
13	0.940	19.638	27.159	819.9	1288.3	1.094	819.9	0.697

STA 23.000 MASS AVERAGED PROPERTIES

PT= 28.163 TT= 643.26 GAMMA=1.4001 PT-RAT= 1.916 TT-RAT= 1.240

RCU= 0. VM= 782.5 CZ= 778.3 MM=0.657 MABS=0.657 MREL=1.244

AVERAGE PCT IMM	RAD	BLADE SPEED IN	OUT	ACC PT RATIO	ACC TT RATIO	EFFICIENCY AD.	EFFICIENCY POLY	AXIAL VEL R
0.	8.500			1.7766	1.2809	0.635	0.663	1.198
4.8	8.340			1.8087	1.2757	0.669	0.696	1.163
9.3	8.186			1.8311	1.2701	0.699	0.723	1.136
18.1	7.890			1.8870	1.2603	0.765	0.785	1.111
26.7	7.602			1.9236	1.2512	0.818	0.834	1.096
35.2	7.315			1.9488	1.2429	0.865	0.877	1.088
44.0	7.021			1.9584	1.2354	0.900	0.909	1.083
53.1	6.715			1.9576	1.2294	0.923	0.930	1.082
62.7	6.391			1.9563	1.2244	0.942	0.948	1.087
73.1	6.042			1.9632	1.2204	0.965	0.968	1.114
84.8	5.648			1.9223	1.2177	0.944	0.949	1.136
91.6	5.419			1.8957	1.2175	0.923	0.929	1.184
100.0	5.137			1.8480	1.2190	0.876	0.887	1.169

EXIT

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                      STA= 24.000                              FREE
         I=25         MTIP=313    AFLOW= 116.57    D+C=0.       D+H=0.
WTF= 61.365  OPTX=DPP OPTY=FREE   ITYPE=0  INBR=0  ABC=0.      A2H=0.
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PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.0	-2.000	8.500	0.	0.	675.8	0.	0.	0.551
0.050	-2.000	8.361	0.32	0.0040	702.4	0.	0.	0.575
0.100	-2.000	8.226	0.63	0.0080	719.7	0.	0.	0.592
0.200	-2.000	7.963	1.18	0.0159	761.5	0.	0.	0.631
0.300	-2.000	7.706	1.68	0.0234	787.9	0.	0.	0.658
0.400	-2.000	7.450	2.16	0.0313	807.1	0.	0.	0.678
0.500	-2.000	7.192	2.64	0.0402	817.9	0.	0.	0.690
0.600	-2.000	6.927	3.13	0.0510	824.8	0.	0.	0.698
0.700	-2.000	6.654	3.63	0.0644	834.8	0.	0.	0.709
0.800	-2.000	6.373	4.11	0.0793	853.9	0.	0.	0.728
0.900	-2.000	6.077	4.60	0.0997	850.7	0.	0.	0.726
0.950	-2.000	5.921	4.85	0.1151	848.5	0.	0.	0.724
1.000	-2.000	5.757	5.28	0.1260	835.5	0.	0.	0.711

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.950	21.247	26.109	664.4	65.75	1645.2	1.341	675.8	0.551
2	0.950	21.244	26.581	661.7	64.54	1634.2	1.338	702.4	0.575
3	0.950	21.236	26.910	658.8	63.63	1620.3	1.332	719.7	0.592
4	0.950	21.203	27.731	653.7	61.54	1598.3	1.325	761.5	0.631
5	0.950	21.144	28.269	649.0	59.91	1571.6	1.312	787.9	0.658
6	0.950	21.058	28.639	644.7	58.45	1542.7	1.295	807.1	0.678
7	0.950	20.939	28.781	640.8	57.20	1509.9	1.273	817.9	0.690
8	0.950	20.778	28.769	637.7	55.99	1474.6	1.248	824.8	0.698
9	0.950	20.562	28.750	635.1	54.59	1440.7	1.223	834.8	0.709
10	0.950	20.274	28.851	633.0	52.79	1412.0	1.204	853.9	0.728
11	0.950	19.892	28.250	631.6	51.58	1368.9	1.168	850.7	0.726
12	0.950	19.653	27.860	631.5	50.92	1346.0	1.148	848.5	0.724
13	0.950	19.382	27.159	632.3	50.57	1315.4	1.120	835.5	0.711

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         STA  24.000  MASS AVERAGED PROPERTIES
PT= 28.163  TT= 643.26  GAMMA=1.4002  PT-RAT= 1.916  TT-RAT= 1.240
RCU=  0.    VM= 801.9   CZ= 800.7  MM=0.674  MABS=0.674  MREL=1.261
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EXIT

WTF= 61.365   I=26   STA= 25.000   AFLOW= 116.27   D*C=0.   D*H=0.
              OPTX=DPP   MTIP=326   ABC=0.   ABH=0.
                         OPTY=FREE ITYPE=0 INBR=0 D*C=0.

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.	-1.270	8.500	0.	0.	693.1	0.	0.	0.566
0.050	-1.270	8.365	0.19	0.0025	718.9	0.	0.	0.590
0.100	-1.270	8.232	0.36	0.0048	735.5	0.	0.	0.606
0.200	-1.270	7.974	0.66	0.0092	775.4	0.	0.	0.644
0.300	-1.270	7.722	0.91	0.0136	799.9	0.	0.	0.668
0.400	-1.270	7.470	1.13	0.0181	816.7	0.	0.	0.686
0.500	-1.270	7.216	1.32	0.0229	824.4	0.	0.	0.696
0.600	-1.270	6.954	1.47	0.0280	827.3	0.	0.	0.700
0.700	-1.270	6.674	1.58	0.0335	831.7	0.	0.	0.706
0.800	-1.270	6.406	1.62	0.0398	843.0	0.	0.	0.718
0.900	-1.270	6.112	1.54	0.0464	828.0	0.	0.	0.705
0.950	-1.270	5.956	1.41	0.0493	817.6	0.	0.	0.695
1.000	-1.270	5.790	0.00	0.1263	798.1	0.	0.	0.676

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.956	21.014	26.109	664.4	65.20	1652.4	1.349	693.1	0.566
2	0.956	21.011	26.581	661.7	64.03	1641.8	1.347	718.9	0.590
3	0.956	21.006	26.910	658.8	63.15	1628.3	1.341	735.5	0.606
4	0.956	20.985	27.731	653.7	61.14	1606.7	1.334	775.4	0.644
5	0.956	20.950	28.269	649.0	59.59	1580.0	1.320	799.9	0.668
6	0.956	20.898	28.639	644.7	58.22	1550.7	1.303	816.7	0.686
7	0.956	20.827	28.781	640.8	57.08	1516.9	1.280	824.4	0.696
8	0.956	20.734	28.769	637.7	56.01	1480.1	1.253	827.3	0.700
9	0.956	20.615	28.750	635.1	54.81	1443.3	1.225	831.7	0.706
10	0.956	20.466	28.851	633.0	53.28	1410.2	1.201	843.0	0.718
11	0.956	20.281	28.250	631.6	52.49	1359.7	1.157	828.0	0.705
12	0.956	20.173	27.860	631.5	52.12	1331.6	1.132	817.6	0.695
13	0.956	19.989	27.159	632.3	52.01	1296.6	1.099	798.1	0.676

STA   25.000   MASS AVERAGED PROPERTIES
PT= 28.163   TT= 643.26   GAMMA=1.4002   PT-RAT= 1.916   TT-RAT= 1.240
RCU= 0.   VM= 803.2   CZ= 803.0   MM=0.675   MABS=0.675   MREL=1.264

EXIT   I=27   STA= 26.000   AFLOW= 116.28   D+C=0.   FREE

WTF= 61.365   OPTX=DPP   MTIP=339   OPTV=FREE   ITYPE=0   INBR=0   ABC=0.   D+H=0.   ABH=0.

PSIC	Z	R	PHI	CURV	VM	CU	ALPHAM	MM
0.0	-0.350	8.500	0.	0.	711.0	0.	0.	0.581
0.050	-0.350	8.367	0.11	-0.0000	735.8	0.	0.	0.605
0.100	-0.350	8.236	0.21	-0.0000	751.6	0.	0.	0.620
0.200	-0.350	7.981	0.37	-0.0000	789.3	0.	0.	0.656
0.300	-0.350	7.731	0.49	-0.0000	811.0	0.	0.	0.679
0.400	-0.350	7.482	0.57	-0.0000	824.4	0.	0.	0.693
0.500	-0.350	7.229	0.61	-0.0000	827.9	0.	0.	0.699
0.600	-0.350	6.968	0.61	-0.0000	825.4	0.	0.	0.698
0.700	-0.350	6.698	0.54	-0.0000	822.9	0.	0.	0.698
0.800	-0.350	6.418	0.39	-0.0000	825.8	0.	0.	0.702
0.900	-0.350	6.120	0.11	-0.0000	799.3	0.	0.	0.678
0.950	-0.350	5.961	-0.10	-0.0000	781.7	0.	0.	0.662
1.000	-0.350	5.791	0.	0.	748.9	0.	0.	0.631

SL	BLDBLK	PS	PT	TT	BETAM	VREL	MREL	VABS	MABS
1	0.956	20.768	26.109	664.4	64.64	1660.0	1.358	711.0	0.581
2	0.956	20.768	26.581	661.7	63.51	1649.7	1.355	735.8	0.605
3	0.956	20.767	26.910	658.8	62.65	1636.3	1.350	751.6	0.620
4	0.956	20.767	27.731	653.7	60.73	1614.5	1.342	789.3	0.656
5	0.956	20.767	28.269	649.0	59.27	1587.2	1.328	811.0	0.679
6	0.956	20.768	28.639	644.7	58.02	1556.6	1.309	824.4	0.693
7	0.956	20.768	28.781	640.8	57.02	1520.8	1.284	827.9	0.699
8	0.956	20.767	28.769	637.7	56.13	1481.0	1.253	825.4	0.698
9	0.956	20.767	28.750	635.1	55.15	1440.3	1.221	822.9	0.698
10	0.956	20.766	28.851	633.0	53.90	1401.6	1.191	825.8	0.702
11	0.956	20.765	28.250	631.6	53.50	1343.6	1.139	799.3	0.678
12	0.956	20.765	27.860	631.5	53.38	1310.6	1.109	781.7	0.662
13	0.956	20.765	27.159	632.3	53.76	1266.9	1.068	748.9	0.631

STA 26.000   MASS AVERAGED PROPERTIES

PT= 28.163   TT= 643.26   GAMMA=1.4002   PT-RAT= 1.916   TT-RAT= 1.240

RCU= 0.   VM= 801.4   CZ= 801.3   MM=0.673   MABS=0.673   MREL=1.263

Phase II Rotor

BLADE FORCES

THE FORCE CALCULATIONS ARE 'PER BLADE ROW'.
TO FIND THE FORCE ON A SINGLE BLADE, DIVIDE BY 'NB'

THE FORCES ARE THAT OF THE AIR ON THE BLADES.
POSITIVE AXIAL IS AFT; POSITIVE TANGENTIAL IS IN ROTATION DIRECTION.
THE COLUMNS HEADED BY F-TAN*, F-AXL*, AND F-RAD* ARE THE TANGENTIAL,
AXIAL, AND RADIAL FORCES PER INCH OF CHANGE IN R-AVG.

SL	R-AVG (IN.)	H-AVG (IN.)	F-TAN* (LB/IN)	F-AXL* (LB/IN)	F-RAD* (LB/IN)
1	8.500	0.	-303.8	-384.3	14.7
2	8.317	0.183	-306.3	-388.7	16.5
3	8.136	0.364	-309.3	-394.6	14.7
4	7.773	0.727	-309.7	-394.6	-10.5
5	7.406	1.094	-306.6	-380.9	-31.4
6	7.026	1.474	-299.2	-357.6	-29.5
7	6.624	1.876	-288.4	-328.7	-19.3
8	6.192	2.308	-275.8	-294.0	-13.3
9	5.716	2.784	-263.8	-254.2	-19.3
10	5.180	3.320	-246.3	-206.4	-20.5
11	4.523	3.977	-214.8	-138.7	-18.2
12	4.102	4.398	-187.2	-84.6	-25.6
13	3.547	4.953	-165.5	-44.5	-31.7

NET TOPQUE=   -8081.5 IN-LB
NET TAN. FORCE= -1290.7 LB
NET AXIAL FORCE= -1288.9 LB
NET RADIAL FORCE= -86.0 LB

2. STREAMSURFACE BLADE COORDINATES

Figure 42 shows the stacked Phase II rotor streamsurface sections. Each page of the following tabulation gives the coordinates for one of these sections. The streamline designation for these sections corresponds to the calculation streamlines of the circumferential average flow calculation. Streamline 1 is at the casing and streamline 13 is at the hub. Also given in the tabulations are coordinates for the section meanline, the meanline angle, and the section thickness at each point. Streamsurface section chord, camber angle, and stagger angle are also given. All dimensions in this tabulation are in inches or degrees.

ROTATION
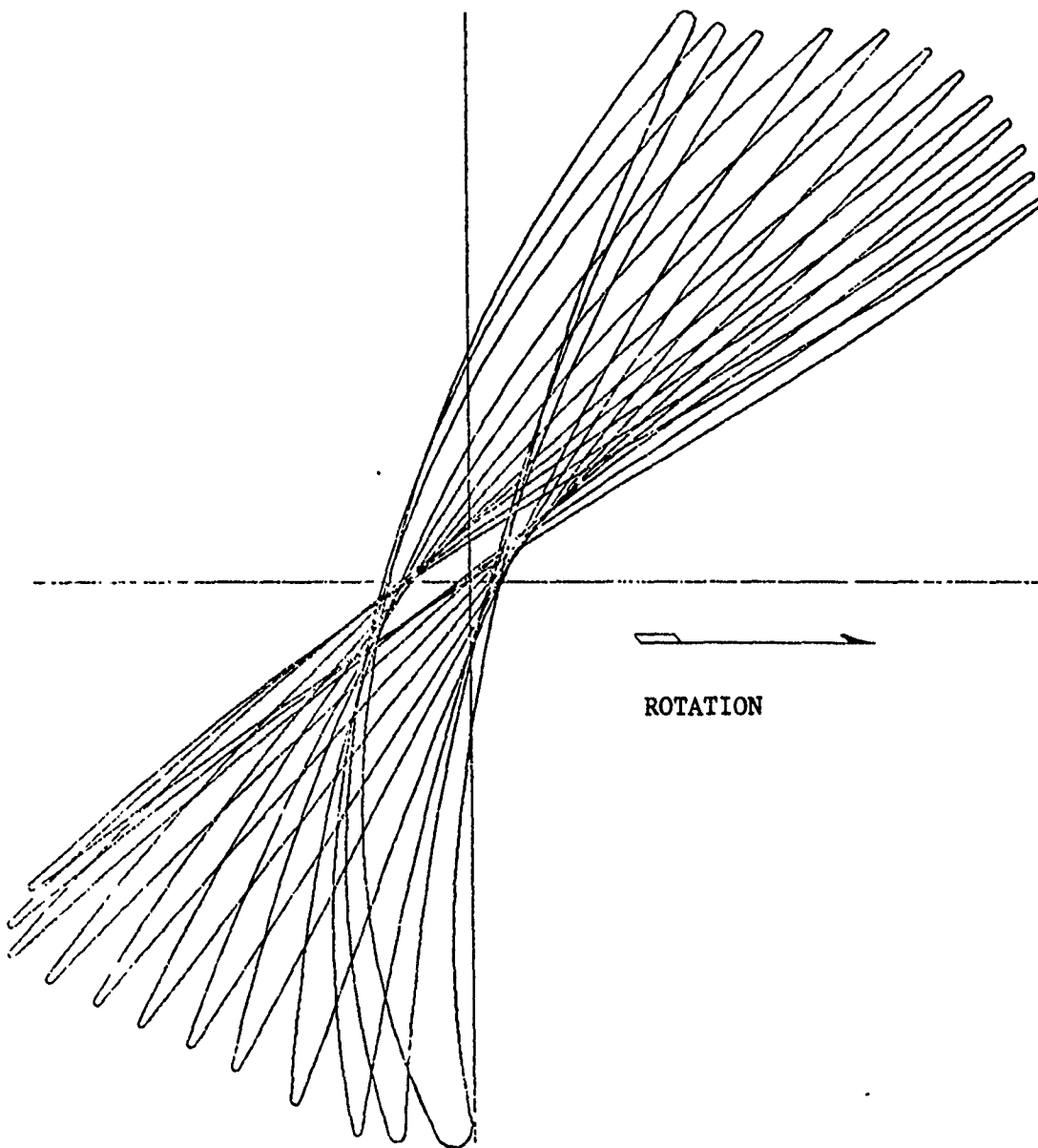
FIGURE _42._   Stacked Phase II Rotor Streamsurface Sections

42

MERIDIONAL AIRFOIL GEOMETRY

MEANLINE INPUT DATA - STREAMLINE 1

PT	Z	R	THETA	B*	T(Z)	PHI	X	B*M	T(M)
1	-1.12970	8.50000	0.21035	-55.012	0.01870	0.	-1.12970	-55.012	0.01870
2	-1.07880	8.50000	0.20170	-55.600	0.02368	0.	-1.07880	-55.600	0.02368
3	-0.97700	8.50000	0.18383	-56.762	0.03380	0.	-0.97700	-56.762	0.03380
4	-0.87530	8.50000	0.16514	-57.952	0.04401	0.	-0.87530	-57.952	0.04401
5	-0.77350	8.50000	0.14557	-59.111	0.05411	0.	-0.77350	-59.111	0.05411
6	-0.66150	8.50000	0.12305	-60.178	0.06481	0.	-0.66150	-60.178	0.06481
7	-0.53940	8.50000	0.09757	-60.877	0.07547	0.	-0.53940	-60.877	0.07547
8	-0.41730	8.50000	0.07172	-60.886	0.08442	0.	-0.41730	-60.886	0.08442
9	-0.29510	8.50000	0.04617	-60.315	0.09107	0.	-0.29510	-60.315	0.09107
10	-0.17300	8.50000	0.02142	-59.386	0.09504	0.	-0.17300	-59.386	0.09504
11	-0.05090	8.50000	-0.00237	-58.354	0.09615	0.	-0.05090	-58.354	0.09615
12	0.07120	8.50000	-0.02524	-57.364	0.09439	0.	0.07120	-57.364	0.09439
13	0.19340	8.50000	-0.04727	-56.414	0.08995	0.	0.19340	-56.414	0.08995
14	0.31550	8.50000	-0.06854	-55.508	0.08302	0.	0.31550	-55.508	0.08302
15	0.43760	8.50000	-0.08912	-54.640	0.07378	0.	0.43760	-54.640	0.07378
16	0.55980	8.50000	-0.10904	-53.762	0.06239	0.	0.55980	-53.762	0.06239
17	0.68190	8.50000	-0.12835	-52.952	0.04896	0.	0.68190	-52.952	0.04896
18	0.80400	8.50000	-0.14718	-52.397	0.03356	0.	0.80400	-52.397	0.03356
19	0.90580	8.50000	-0.16263	-52.074	0.01923	0.	0.90580	-52.074	0.01923

MEANLINE INPUT DATA - STREAMLINE 3

PT	Z	R	THETA	B*	T(Z)	PHI	X	B*M	T(M)
1	-1.20600	8.13900	0.21629	-53.818	0.01934	0.789	-1.20603	-53.815	0.01934
2	-1.15050	8.13980	0.20687	-54.369	0.02460	0.774	-1.15053	-54.366	0.02460
3	-1.03940	8.14130	0.18745	-55.472	0.03525	0.710	-1.03942	-55.470	0.03525
4	-0.92840	8.14260	0.16719	-56.638	0.04597	0.550	-0.92841	-56.636	0.04597
5	-0.81730	8.14350	0.14602	-57.747	0.05653	0.311	-0.81731	-57.746	0.05653
6	-0.69520	8.14390	0.12181	-58.605	0.06764	0.075	-0.69521	-58.605	0.06764
7	-0.56190	8.14370	0.09476	-58.947	0.07855	-0.096	-0.56191	-58.947	0.07855
8	-0.42870	8.14340	0.06769	-58.650	0.08759	-0.203	-0.42871	-58.650	0.08759
9	-0.29540	8.14280	0.04119	-57.897	0.09426	-0.286	-0.29540	-57.897	0.09426
10	-0.16210	8.14200	0.01557	-56.940	0.09824	-0.352	-0.16210	-56.939	0.09824
11	-0.02890	8.14110	-0.00912	-55.987	0.09937	-0.324	-0.02890	-55.986	0.09937
12	0.10440	8.14050	-0.03299	-55.130	0.09761	-0.210	0.10440	-55.130	0.09761
13	0.23760	8.14020	-0.05613	-54.321	0.09309	-0.116	0.23760	-54.321	0.09309
14	0.37090	8.14000	-0.07859	-53.490	0.08598	-0.140	0.37030	-53.490	0.08598
15	0.50420	8.13960	-0.10035	-52.602	0.07644	-0.335	0.50420	-52.601	0.07644
16	0.63740	8.13840	-0.12143	-51.739	0.06462	-0.660	0.63741	-51.737	0.06462
17	0.77070	8.13650	-0.14188	-50.867	0.05065	-0.912	0.77072	-50.863	0.05065
18	0.90390	8.13440	-0.16166	-49.823	0.03468	-0.811	0.90394	-49.820	0.03468
19	1.01500	8.13250	-0.17755	-48.832	0.01998	-0.534	1.01505	-48.831	0.01998

MERIDIONAL AIRFOIL GEOMETRY

MEANLINE INPUT DATA - STREAMLINE 4

PT	Z	R	THETA	B*	T(Z)	PHI	X	B+M	T(M)
1	-1.28580	7.76020	0.22314	-52.567	0.01994	1.667	-1.28603	-52.556	0.01995
2	-1.22610	7.76190	0.21296	-53.238	0.02594	1.659	-1.22630	-53.226	0.02595
3	-1.10660	7.76540	0.19187	-54.482	0.03812	1.617	-1.10676	-54.471	0.03813
4	-0.98710	7.76870	0.16388	-55.546	0.05034	1.497	-0.98721	-55.537	0.05035
5	-0.86760	7.77170	0.14710	-56.350	0.06230	1.305	-0.86768	-56.343	0.06231
6	-0.73620	7.77450	0.12144	-56.818	0.07471	1.083	-0.73675	-56.813	0.07472
7	-0.59280	7.77680	0.09321	-56.788	0.08675	0.867	-0.59283	-56.785	0.08676
8	-0.44950	7.77880	0.06530	-56.236	0.09662	0.674	-0.44951	-56.234	0.09662
9	-0.30610	7.78030	0.03818	-55.337	0.10384	0.492	-0.30611	-55.336	0.10384
10	-0.16270	7.78120	0.01203	-54.321	0.10814	0.330	-0.16270	-54.321	0.10814
11	-0.01930	7.78180	-0.01319	-53.388	0.10935	0.240	-0.01930	-53.388	0.10935
12	0.12400	7.78240	-0.03761	-52.571	0.10740	0.237	0.12400	-52.570	0.10740
13	0.26740	7.78300	-0.06133	-51.733	0.10241	0.280	0.26740	-51.733	0.10241
14	0.41080	7.78380	-0.08433	-50.888	0.09453	0.300	0.41080	-50.888	0.09453
15	0.55410	7.78460	-0.10666	-50.083	0.08391	0.239	0.55411	-50.083	0.08391
16	0.69750	7.78500	-0.12836	-49.255	0.07071	0.115	0.69751	-49.255	0.07071
17	0.84090	7.78510	-0.14939	-48.286	0.05505	0.097	0.84091	-48.286	0.05505
18	0.98430	7.78570	-0.16962	-47.040	0.03714	0.443	0.98431	-47.039	0.03714
19	1.10370	7.78660	-0.18576	-45.828	0.02064	0.925	1.10372	-45.825	0.02064

MEANLINE INPUT DATA - STREAMLINE 5

PT	Z	R	THETA	B*	T(Z)	PHI	X	B+M	T(M)
1	-1.36080	7.35960	0.22867	-51.279	0.02020	2.850	-1.36205	-51.244	0.02022
2	-1.29730	7.36280	0.21780	-51.830	0.02752	2.847	-1.29847	-51.796	0.02754
3	-1.17030	7.36920	0.19546	-52.831	0.04230	2.839	-1.17131	-52.797	0.04233
4	-1.04330	7.37550	0.17240	-53.608	0.05701	2.820	-1.04416	-53.575	0.05705
5	-0.91630	7.38170	0.14880	-54.129	0.07126	2.781	-0.91700	-54.097	0.07132
6	-0.77660	7.38840	0.12248	-54.429	0.08591	2.696	-0.77714	-54.399	0.08597
7	-0.62430	7.39550	0.09368	-54.262	0.10000	2.529	-0.62468	-54.235	0.10006
8	-0.47190	7.40190	0.06550	-53.292	0.11140	2.264	-0.47215	-53.271	0.11146
9	-0.31950	7.40750	0.03857	-51.917	0.11961	1.971	-0.31965	-51.901	0.11965
10	-0.16710	7.41240	0.01291	-50.690	0.12441	1.726	-0.16717	-50.678	0.12444
11	-0.01470	7.41670	-0.01171	-49.608	0.12565	1.549	-0.01471	-49.597	0.12568
12	0.13770	7.42060	-0.03543	-48.624	0.12326	1.448	0.13775	-48.615	0.12328
13	0.29010	7.42440	-0.05838	-47.750	0.11739	1.433	0.29019	-47.741	0.11741
14	0.44240	7.42820	-0.08064	-46.929	0.10818	1.468	0.44254	-46.920	0.10820
15	0.59480	7.43220	-0.10226	-46.087	0.09576	1.521	0.59499	-46.077	0.09578
16	0.74720	7.43620	-0.12323	-45.202	0.08028	1.612	0.74745	-45.190	0.08030
17	0.89960	7.44070	-0.14353	-44.258	0.06185	1.846	0.89992	-44.243	0.06187
18	1.05200	7.44640	-0.16314	-43.245	0.04061	2.362	1.05242	-43.221	0.04063
19	1.17900	7.45180	-0.17893	-42.356	0.02087	2.935	1.17956	-42.318	0.02088

PHASE II ROTOR

MERIDIONAL AIRFOIL GEOMETRY

MEANLINE INPUT DATA - STREAMLINE 6

PT	Z	R	THETA	B•	T(Z)	PHI	X	B•M	T(M)
1	-1.42970	6.93260	0.23286	-49.989	0.02029	4.404	-1.43381	-49.905	0.02033
2	-1.36280	6.93790	0.22128	-50.432	0.02955	4.446	-1.36671	-50.348	0.02960
3	-1.22900	6.94840	0.19763	-51.192	0.04817	4.536	-1.23250	-51.104	0.04826
4	-1.09520	6.95910	0.17349	-51.627	0.06652	4.636	-1.09827	-51.536	0.06665
5	-0.96150	6.97000	0.14917	-51.740	0.08409	4.717	-0.96412	-51.646	0.08427
6	-0.81430	6.98230	0.12244	-51.686	0.10192	4.711	-0.81642	-51.592	0.10213
7	-0.65380	6.99550	0.09355	-51.237	0.11889	4.554	-0.65539	-51.148	0.11912
8	-0.49330	7.00790	0.06559	-49.910	0.13251	4.264	-0.49441	-49.831	0.13272
9	-0.33280	7.01940	0.03923	-48.148	0.14223	3.952	-0.33350	-48.080	0.14242
10	-0.17230	7.03000	0.01441	-46.642	0.14783	3.706	-0.17264	-46.582	0.14799
11	-0.01180	7.04020	-0.00922	-45.382	0.14917	3.490	-0.01182	-45.329	0.14931
12	0.14880	7.04970	-0.03186	-44.256	0.14619	3.299	0.14906	-44.208	0.14631
13	0.30930	7.05870	-0.05362	-43.195	0.13904	3.179	0.30982	-43.151	0.13914
14	0.46980	7.06750	-0.07458	-42.202	0.12791	3.165	0.47056	-42.158	0.12800
15	0.63030	7.07640	-0.09484	-41.303	0.11291	3.273	0.63131	-41.257	0.11299
16	0.79080	7.08570	-0.11447	-40.503	0.09414	3.503	0.79209	-40.451	0.09421
17	0.95130	7.09590	-0.13356	-39.780	0.07167	3.884	0.95292	-39.716	0.07174
18	1.11190	7.10780	-0.15215	-39.087	0.04554	4.463	1.11395	-39.002	0.04559
19	1.24560	7.11850	-0.16727	-38.512	0.02102	5.038	1.24811	-38.404	0.02105

MEANLINE INPUT DATA - STREAMLINE 7

PT	Z	R	THETA	B•	T(Z)	PHI	X	B•M	T(M)
1	-1.49500	6.47130	0.23569	-48.713	0.01988	6.418	-1.50486	-48.534	0.01995
2	-1.42500	6.47940	0.22332	-48.967	0.03215	6.520	-1.43441	-48.782	0.03227
3	-1.28500	6.49570	0.19833	-49.395	0.05668	6.711	-1.29348	-49.200	0.05690
4	-1.14510	6.51230	0.17311	-49.602	0.08068	6.861	-1.15259	-49.398	0.08102
5	-1.00510	6.52930	0.14791	-49.511	0.10350	6.942	-1.01156	-49.302	0.10394
6	-0.85110	6.54810	0.12052	-49.036	0.12646	6.914	-0.85643	-48.829	0.12699
7	-0.68310	6.56850	0.09152	-47.942	0.14805	6.756	-0.68722	-47.744	0.14862
8	-0.51520	6.58800	0.06406	-46.098	0.16518	6.530	-0.51818	-45.911	0.16574
9	-0.34720	6.60680	0.03855	-44.051	0.17733	6.283	-0.34913	-43.878	0.17785
10	-0.17920	6.62500	0.01469	-42.450	0.18432	6.035	-0.18015	-42.292	0.18479
11	-0.01120	6.64240	-0.00791	-41.048	0.18594	5.774	-0.01126	-40.904	0.18635
12	0.15670	6.65890	-0.02937	-39.670	0.18210	5.546	0.15746	-39.538	0.18245
13	0.32470	6.67500	-0.04980	-38.416	0.17298	5.451	0.32624	-38.290	0.17328
14	0.49270	6.69090	-0.06934	-37.324	0.15878	5.476	0.49500	-37.198	0.15905
15	0.66070	6.70720	-0.08813	-36.387	0.13962	5.588	0.66379	-36.256	0.13985
16	0.82860	6.72370	-0.10628	-35.554	0.11558	5.822	0.83252	-35.414	0.11578
17	0.99660	6.74120	-0.12387	-34.853	0.08670	6.213	1.00144	-34.695	0.08687
18	1.16460	6.76060	-0.14103	-34.369	0.05296	6.777	1.17053	-34.182	0.05308
19	1.30460	6.77760	-0.15509	-34.072	0.02110	7.324	1.31159	-33.854	0.02115

PHASE II ROTOR

MERIDIONAL AIRFOIL GEOMETRY

MEANLINE INPUT DATA - SIREAMLINE 8

PT	Z	R	THETA	B*	T(Z)	PHI	X	B*M	T(M)
1	-1.55440	5.96420	0.23732	-47.543	0.01889	9.000	-1.57422	-47.190	0.01902
2	-1.48170	5.97610	0.22397	-47.652	0.03411	9.131	-1.50060	-47.288	0.03435
3	-1.33620	6.00000	0.19723	-47.806	0.06434	9.349	-1.35319	-47.424	0.06481
4	-1.19070	6.02400	0.17053	-47.766	0.09373	9.433	-1.20571	-47.377	0.09443
5	-1.04510	6.04820	0.14414	-47.325	0.12146	9.391	-1.05812	-46.940	0.12234
6	-0.88510	6.07460	0.11605	-46.037	0.14906	9.310	-0.89596	-45.657	0.15008
7	-0.7105?	6.10310	0.08739	-43.824	0.17460	9.214	-0.71905	-43.453	0.17568
8	-0.53580	6.13120	0.06108	-41.545	0.19472	9.059	-0.54211	-41.188	0.19579
9	-0.36120	6.15880	0.03679	-39.536	0.20908	8.857	-0.36535	-39.199	0.21009
10	-0.18660	6.18560	0.01416	-37.818	0.21742	8.645	-0.18869	-37.501	0.21835
11	-0.01200	6.21190	-0.00708	-36.192	0.21942	8.461	-0.01213	-35.894	0.22025
12	0.16260	6.23760	-0.02701	-34.611	0.21493	8.325	0.16436	-34.328	0.21566
13	0.33720	6.26290	-0.04578	-33.219	0.20416	8.243	0.34080	-32.947	0.20479
14	0.51180	6.28810	-0.06357	-31.991	0.18727	8.232	0.51721	-31.725	0.18781
15	0.68640	6.31350	-0.08051	-30.888	0.16439	8.328	0.69365	-30.621	0.16485
16	0.86110	6.33920	-0.09673	-30.039	0.13554	8.589	0.87026	-29.759	0.13592
17	1.03570	6.36600	-0.11243	-29.472	0.10072	9.010	1.04694	-29.169	0.10102
18	1.21030	6.39470	-0.12777	-29.081	0.05983	9.522	1.22384	-28.745	0.06002
19	1.35580	6.41970	-0.14033	-28.816	0.02109	9.979	1.37148	-28.449	0.02116

MEANLINE INPUT DATA - SIREAMLINE 9

PT	Z	R	THETA	B*	T(Z)	PHI	X	B*M	T(M)
1	-1.59200	5.39270	0.23565	-46.431	0.01837	12.123	-1.62875	-45.785	0.01859
2	-1.51700	5.40930	0.22106	-46.362	0.03630	12.281	-1.55202	-45.700	0.03674
3	-1.36690	5.44270	0.19216	-46.103	0.07176	12.535	-1.39833	-45.413	0.07265
4	-1.21680	5.47610	0.16386	-45.478	0.10594	12.603	-1.24453	-44.779	0.10725
5	-1.06670	5.50960	0.13659	-44.311	0.13794	12.494	-1.09075	-43.625	0.13954
6	-0.90160	5.54600	0.10837	-42.301	0.16954	12.338	-0.92170	-41.635	0.17132
7	-0.72150	5.58510	0.08028	-39.571	0.19866	12.206	-0.73739	-38.929	0.20049
8	-0.54140	5.62390	0.05487	-37.173	0.22168	12.069	-0.55317	-36.558	0.22347
9	-0.36130	5.66220	0.03153	-35.226	0.23829	11.913	-0.36905	-34.641	0.24000
10	-0.18120	5.69990	0.00988	-33.428	0.24812	11.755	-0.18504	-32.872	0.24970
11	-0.00110	5.73710	-0.01022	-31.634	0.25069	11.640	-0.00112	-31.105	0.25211
12	0.17900	5.77410	-0.02882	-29.816	0.24576	11.590	0.18274	-29.310	0.24700
13	0.35910	5.81090	-0.04600	-28.057	0.23351	11.593	0.36659	-27.570	0.23456
14	0.53920	5.84790	-0.06191	-26.445	0.21413	11.659	0.55045	-25.972	0.21500
15	0.71940	5.89520	-0.07671	-25.062	0.18772	11.813	0.73449	-24.594	0.18843
16	0.89950	5.92320	-0.09060	-23.963	0.15431	12.107	0.91858	-23.438	0.15487
17	1.07960	5.96240	-0.10380	-23.163	0.11386	12.507	1.10292	-22.669	0.11428
18	1.25970	6.00320	-0.11651	-22.623	0.06625	12.901	1.28754	-22.108	0.06650
19	1.40980	6.03810	-0.12681	-22.282	0.02103	13.210	1.44162	-21.748	0.02111

PHASE II ROTOR

MERIDIONAL AIRFOIL GEOMETRY

MEANLINE INPUT DATA - STREAMLINE 10

PT	Z	R	THETA	B*	T(Z)	PHI	X	B*M	T(M)
1	-1.56670	4.73250	0.22884	-45.229	0.02055	16.174	-1.63125	-44.072	0.02096
2	-1.49060	4.75520	0.21273	-44.988	0.04056	16.341	-1.55198	-43.807	0.04139
3	-1.33830	4.80070	0.18124	-44.251	0.07999	16.607	-1.39315	-43.032	0.08163
4	-1.18600	4.84620	0.15119	-42.750	0.11777	16.674	-1.23418	-41.525	0.12007
5	-1.03380	4.89160	0.12337	-40.453	0.15282	16.548	-1.07534	-39.264	0.15550
6	-0.86630	4.94110	0.09570	-37.734	0.18724	16.348	-0.90059	-36.596	0.19008
7	-0.68360	4.99450	0.06860	-35.046	0.21919	16.133	-0.71040	-33.971	0.22203
8	-0.50090	5.04680	0.04421	-32.649	0.24482	15.901	-0.52032	-31.642	0.24754
9	-0.31810	5.09850	0.02210	-30.453	0.26356	15.711	-0.33034	-29.508	0.26608
10	-0.13540	5.14960	0.00201	-28.321	0.27488	15.631	-0.14060	-27.429	0.27715
11	0.04730	5.20070	-0.01616	-26.119	0.27825	15.656	0.04912	-25.273	0.28023
12	0.23000	5.25200	-0.03244	-23.775	0.27336	15.775	0.23891	-22.974	0.27502
13	0.41270	5.30390	-0.04682	-21.328	0.26029	15.976	0.42885	-20.575	0.26160
14	0.59540	5.35660	-0.05940	-19.034	0.23916	16.224	0.61900	-18.328	0.24016
15	0.77810	5.41020	-0.07048	-17.178	0.20995	16.508	0.80941	-16.509	0.21069
16	0.96080	5.46490	-0.08041	-15.828	0.17258	16.892	1.00015	-15.178	0.17312
17	1.14360	5.52100	-0.08953	-14.890	0.12691	17.282	1.19141	-14.246	0.12728
18	1.32630	5.57850	-0.09805	-14.146	0.07274	17.457	1.38286	-13.519	0.07294
19	1.47850	5.62700	-0.10475	-13.576	0.02103	17.480	1.54242	-12.971	0.02108

MEANLINE INPUT DATA - STREAMLINE 11

PT	Z	R	THETA	B*	T(Z)	PHI	X	B*M	T(M)
1	-1.51000	3.90290	0.22127	-43.630	0.02498	21.609	-1.62361	-41.550	0.02583
2	-1.43470	3.93350	0.20310	-43.150	0.04603	21.757	-1.54258	-41.044	0.04758
3	-1.28400	3.99450	0.16818	-41.936	0.08752	21.978	-1.38018	-39.797	0.09039
4	-1.13340	4.05530	0.13558	-40.014	0.12735	21.985	-1.21775	-37.900	0.13121
5	-0.98280	4.11570	0.10600	-37.372	0.16457	21.798	-1.05544	-35.343	0.16892
6	-0.81710	4.18160	0.07716	-34.300	0.20147	21.576	-0.87712	-32.389	0.20594
7	-0.63630	4.25290	0.04962	-31.124	0.23609	21.398	-0.68282	-29.344	0.24040
8	-0.45560	4.32330	0.02573	-27.944	0.26425	21.242	-0.48885	-26.308	0.26814
9	-0.27490	4.39320	0.00511	-24.962	0.28528	21.189	-0.29503	-23.462	0.28866
10	-0.09410	4.46340	-0.01277	-22.379	0.29854	21.319	-0.10105	-20.985	0.30144
11	0.08660	4.53420	-0.02829	-19.818	0.30351	21.598	0.09309	-18.525	0.30590
12	0.26740	4.60640	-0.04151	-17.144	0.29971	21.992	0.28780	-15.962	0.30155
13	0.44810	4.68020	-0.05256	-14.559	0.28687	22.477	0.48301	-13.495	0.28820
14	0.62890	4.75590	-0.06160	-11.933	0.26485	23.000	0.67904	-11.003	0.26572
15	0.80960	4.83360	-0.06862	-9.146	0.23346	23.517	0.87573	-8.398	0.23393
16	0.99040	4.91350	-0.07370	-6.497	0.19240	24.027	1.07330	-5.939	0.19260
17	1.17110	4.99480	-0.07707	-4.081	0.14140	24.335	1.27143	-3.719	0.14146
18	1.35190	5.07640	-0.07889	-1.715	0.08033	24.136	1.46977	-1.565	0.08034
19	1.50250	5.14450	-0.07926	0.283	0.02159	23.714	1.63454	0.259	0.02159

MERIDIONAL AIRFOIL GEOMETRY

MEANLINE INPUT DATA - STREAMLINE 12

PT	Z	R	THETA	B*	T(Z)	PHI	X	B*M	T(M)
1	-1.49020	3.35910	0.22137	-41.273	0.03344	25.674	-1.64725	-38.346	0.03490
2	-1.41650	3.39530	0.20238	-40.745	0.05388	25.706	-1.56546	-37.820	0.05618
3	-1.26900	3.46710	0.16616	-39.426	0.09436	25.696	-1.40175	-36.534	0.09815
4	-1.12160	3.53770	0.13268	-37.411	0.13355	25.465	-1.23830	-34.628	0.13835
5	-0.97420	3.60690	0.10257	-34.728	0.17052	25.084	-1.07530	-32.120	0.17572
6	-0.81200	3.68220	0.07341	-31.778	0.20756	24.816	-0.89643	-29.349	0.21282
7	-0.63510	3.76390	0.04560	-28.877	0.24279	24.801	-0.70158	-26.594	0.24793
8	-0.45810	3.84560	0.02152	-25.805	0.27209	24.909	-0.50652	-23.679	0.27678
9	-0.28120	3.92800	0.00101	-22.737	0.29469	25.126	-0.31132	-20.777	0.29874
10	-0.10430	4.01150	-0.01643	-20.029	0.30973	25.482	-0.11567	-18.215	0.31315
11	0.07260	4.09660	-0.03123	-17.408	0.31658	25.958	0.08067	-15.743	0.31933
12	0.24960	4.18380	-0.04351	-14.592	0.31459	26.559	0.27802	-13.108	0.31661
13	0.42650	4.27350	-0.05322	-11.457	0.30344	27.302	0.47643	-10.209	0.30471
14	0.60340	4.36620	-0.06027	-8.024	0.28293	28.050	0.67619	-7.092	0.28354
15	0.78030	4.46210	-0.06465	-4.434	0.25272	28.692	0.87725	-3.892	0.25289
16	0.95720	4.56060	-0.06649	-0.948	0.21254	29.324	1.07954	-0.826	0.21255
17	1.13420	4.66060	-0.06596	2.611	0.16222	29.664	1.28300	2.269	0.16226
18	1.31110	4.76070	-0.06291	6.813	0.10169	29.136	1.48619	5.958	0.10186
19	1.45850	4.84410	-0.05819	10.698	0.04321	28.232	1.65425	9.450	0.04338

MEANLINE INPUT DATA - STREAMLINE 13

PT	Z	R	THETA	B*	T(Z)	PHI	X	B*M	T(M)
1	-1.47050	2.65330	0.23827	-36.526	0.05039	31.139	-1.68416	-32.373	0.05296
2	-1.39980	2.69460	0.21882	-36.125	0.06917	30.509	-1.60183	-32.163	0.07249
3	-1.25830	2.77620	0.18170	-35.141	0.10671	29.348	-1.43859	-31.531	0.11123
4	-1.11680	2.85490	0.14718	-33.745	0.14340	28.479	-1.27698	-30.422	0.14871
5	-0.97530	2.93070	0.11560	-31.862	0.17838	27.969	-1.11643	-28.764	0.18411
6	-0.81970	3.01270	0.08457	-29.340	0.21417	27.754	-0.94047	-26.447	0.21997
7	-0.64990	3.10230	0.05521	-26.361	0.24915	27.933	-0.74851	-23.645	0.25472
8	-0.48010	3.19340	0.03009	-23.624	0.27896	28.599	-0.55579	-21.008	0.28424
9	-0.31040	3.28790	0.00851	-21.156	0.30296	29.667	-0.36156	-18.586	0.30791
10	-0.14060	3.38720	-0.00996	-18.710	0.32048	30.955	-0.16488	-16.195	0.32493
11	0.02920	3.49170	-0.02544	-16.015	0.33069	32.210	0.03447	-13.650	0.33432
12	0.19900	3.60090	-0.03784	-12.931	0.33250	33.325	0.23643	-10.860	0.33504
13	0.36880	3.71480	-0.04706	-9.438	0.32520	34.348	0.44088	-7.814	0.32660
14	0.53850	3.83300	-0.05289	-5.115	0.30871	35.318	0.64763	-4.177	0.30912
15	0.70830	3.95520	-0.05478	0.379	0.28281	36.212	0.85693	0.306	0.28281
16	0.87810	4.08130	-0.05223	6.606	0.24708	36.868	1.06835	5.293	0.24767
17	1.04790	4.20930	-0.04512	13.141	0.20175	37.049	1.28100	10.555	0.20367
18	1.21760	4.33580	-0.03339	19.749	0.14773	36.538	1.49305	16.090	0.15081
19	1.35910	4.44020	-0.02005	25.139	0.09622	35.780	1.66835	20.841	0.09933

PHASE II ROTOR

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 1

------ MEANLINE DATA ------

PT	PCT X	X	Y	B*M	T(M)
1	0.	-1.12970	1.78798	-55.012	0.01870
2	0.02500	-1.07881	1.71447	-55.600	0.02368
3	0.05000	-1.02792	1.63933	-56.179	0.02871
4	0.07500	-0.97704	1.56254	-56.761	0.03380
5	0.10000	-0.92615	1.48401	-57.354	0.03891
6	0.12500	-0.87526	1.40365	-57.952	0.04401
7	0.15000	-0.82438	1.32142	-58.545	0.04909
8	0.17500	-0.77349	1.23729	-59.112	0.05411
9	0.20000	-0.72260	1.15132	-59.634	0.05905
10	0.23000	-0.66154	1.04591	-60.178	0.06481
11	0.26000	-0.60047	0.93840	-60.605	0.07031
12	0.29000	-0.53941	0.82934	-60.876	0.07547
13	0.32000	-0.47834	0.71946	-60.966	0.08020
14	0.35000	-0.41727	0.60958	-60.886	0.08442
15	0.38000	-0.35621	0.50038	-60.660	0.08806
16	0.41000	-0.29514	0.39246	-60.315	0.09107
17	0.44000	-0.23408	0.28625	-59.879	0.09340
18	0.47000	-0.17301	0.18202	-59.386	0.09504
19	0.50000	-0.11195	0.07987	-58.870	0.09596
20	0.53000	-0.05088	-0.02022	-58.354	0.09615
21	0.56000	0.01018	-0.11833	-57.852	0.09562
22	0.59000	0.07125	-0.21458	-57.364	0.09439
23	0.62000	0.13231	-0.30906	-56.884	0.09249
24	0.65000	0.19338	-0.40184	-56.414	0.08995
25	0.68000	0.25444	-0.49300	-55.955	0.08679
26	0.71000	0.31551	-0.58262	-55.508	0.08302
27	0.74000	0.37657	-0.67078	-55.072	0.07867
28	0.77000	0.43764	-0.75752	-54.639	0.07378
29	0.80000	0.49870	-0.84289	-54.201	0.06835
30	0.83000	0.55977	-0.92688	-53.763	0.06239
31	0.86000	0.62083	-1.00955	-53.336	0.05592
32	0.89000	0.68190	-1.09099	-52.952	0.04896
33	0.92000	0.74296	-1.17142	-52.642	0.04152
34	0.95000	0.80403	-1.25104	-52.397	0.03356
35	0.97500	0.85491	-1.31691	-52.228	0.02650
36	1.00000	0.90580	-1.38239	-52.074	0.01923

------ SURFACE COORDINATES ------

PT	XS	YS	XP	YP
1	-1.12970	1.78798	-1.12970	1.78798
2	-1.13371	1.78145	-1.12203	1.78947
3	-1.13223	1.77482	-1.11647	1.78582
4	-1.08858	1.70778	-1.06904	1.72116
5	-1.03985	1.63134	-1.01600	1.64733
6	-0.99117	1.55328	-0.96290	1.57180
7	-0.94253	1.47351	-0.90977	1.49450
8	-0.89392	1.39198	-0.85661	1.41533
9	-0.84531	1.30861	-0.80344	1.33423
10	-0.79671	1.22340	-0.75027	1.25118
11	-0.74807	1.13639	-0.69713	1.16624
12	-0.68965	1.02979	-0.63342	1.06202
13	-0.63110	0.92115	-0.56984	0.95566
14	-0.57237	0.81097	-0.50644	0.84770
15	-0.51340	0.70000	-0.44328	0.73893
16	-0.45415	0.58904	-0.38040	0.63011
17	-0.39459	0.47881	-0.31783	0.52196
18	-0.33470	0.36991	-0.25559	0.41501
19	-0.27448	0.26282	-0.19368	0.30969
20	-0.21391	0.15782	-0.13212	0.20622
21	-0.15302	0.05506	-0.07088	0.10467
22	-0.09181	-0.04544	-0.00996	0.00501
23	-0.03030	-0.14377	0.05066	-0.09289
24	0.03150	-0.24003	0.11099	-0.18913
25	0.09358	-0.33432	0.17104	-0.28379
26	0.15591	-0.42672	0.23084	-0.37696
27	0.21841)	-0.51730	0.29040	-0.46871
28	0.28129	-0.60613	0.34972	-0.55912
29	0.34432	-0.69330	0.40882	-0.64826
30	0.40755	-0.77887	0.46772	-0.73618
31	0.47098	-0.86288	0.52642	-0.82290
32	0.53460	-0.94532	0.58493	-0.90844
33	0.59840	-1.02624	0.64326	-0.99285
34	0.66236	-1.10574	0.70143	-1.07624
35	0.72646	-1.18402	0.75946	-1.15882
36	0.79073	-1.26128	0.81732	-1.24080
37	0.84444	-1.32502	0.86539	-1.30879
38	0.89198	-1.38098	0.90782	-1.36865
39	0.89801	-1.38438	0.90963	-1.37537
40	0.90580	-1.38239	0.90580	-1.38239

CHORD 3.76756   CAMBER 2.938   STAGGER -57.298

PHASE II ROTOR

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 3

		------- MEANLINE DATA -------					------- SURFACE COORDINATES -------		
PT	PCT X	X	Y	B*M	T(M)	PT	XS	YS	XP	YP
1	0.	-1.20603	1.76118	-53.815	0.01934	1	-1.20603	1.76118	-1.20603	1.76118
2	0.02500	-1.15051	1.68450	-54.366	0.02460	2	-1.21004	1.75433	-1.19814	1.76289
3	0.05000	-1.09498	1.60625	-54.913	0.02991	3	-1.20836	1.74752	-1.19231	1.75924
4	0.07500	-1.03945	1.52638	-55.470	0.03525	4	-1.16050	1.67733	-1.14051	1.69166
5	0.10000	-0.98392	1.44481	-56.048	0.04062	5	-1.10721	1.59765	-1.08274	1.61484
6	0.12500	-0.92840	1.36141	-56.637	0.04597	6	-1.05397	1.51639	-1.02493	1.53637
7	0.15000	-0.87287	1.27614	-57.215	0.05128	7	-1.00077	1.43346	-0.96708	1.45615
8	0.17500	-0.81734	1.18902	-57.746	0.05653	8	-0.94760	1.34877	-0.90920	1.37405
9	0.20000	-0.76182	1.10024	-58.195	0.06167	9	-0.89443	1.26225	-0.85131	1.29002
10	0.23000	-0.69518	0.99187	-58.605	0.06764	10	-0.84125	1.17394	0.79344	1.20411
11	0.26000	-0.62855	0.88209	-58.858	0.07329	11	-0.78802	1.08398	-0.73561	1.11649
12	0.29000	-0.56192	0.77156	-58.947	0.07855	12	-0.72405	0.97425	-0.66631	1.00949
13	0.32000	-0.49529	0.66101	-58.870	0.08334	13	-0.65992	0.86313	-0.59719	0.90104
14	0.35000	-0.42866	0.55111	-58.650	0.08759	14	-0.59557	0.75130	-0.52827	0.79182
15	0.38000	-0.36202	0.44242	-58.315	0.09125	15	-0.53096	0.63946	-0.45962	0.68255
16	0.41000	-0.29539	0.33532	-57.897	0.09426	16	-0.46606	0.52832	-0.39125	0.57390
17	0.44000	-0.22876	0.23005	-57.429	0.09660	17	-0.40085	0.41845	-0.32320	0.46638
18	0.47000	-0.16213	0.12672	-56.940	0.09824	18	-0.33531	0.31027	-0.25547	0.36037
19	0.50000	-0.09549	0.02529	-56.454	0.09917	19	-0.26946	0.20405	-0.18805	0.25605
20	0.53000	-0.02886	-0.07431	-55.986	0.09937	20	-0.20329	0.09992	-0.12096	0.15351
21	0.56000	0.03777	-0.17223	-55.547	0.09885	21	-0.13682	-0.00211	0.05417	0.05269
22	0.59000	0.10440	-0.26859	-55.130	0.09761	22	-0.07005	-0.10210	0.01232	-0.04651
23	0.62000	0.17104	-0.36349	-54.724	0.09568	23	-0.00298	-0.20019	0.07853	-0.14427
24	0.65000	0.23767	-0.45698	-54.321	0.09309	24	0.06436	-0.29649	0.14445	-0.24069
25	0.68000	0.30430	-0.54909	-53.912	0.08985	25	0.13198	-0.39112	0.21009	-0.33586
26	0.71000	0.37093	-0.63981	-53.490	0.08598	26	0.19986	-0.48413	0.27548	-0.42984
27	0.74000	0.43757	-0.72911	-53.048	0.08150	27	0.26800	-0.57555	0.34060	-0.52263
28	0.77000	0.50420	-0.81697	-52.601	0.07644	28	0.33638	-0.66539	0.40549	-0.61423
29	0.80000	0.57083	-0.90344	-52.164	0.07081	29	0.40500	-0.75361	0.47013	-0.70461
30	0.83000	0.63746	-0.98857	-51.737	0.06462	30	0.47383	-0.84019	0.53456	-0.79376
31	0.86000	0.70409	-1.07242	-51.312	0.05789	31	0.54287	-0.92516	0.59879	-0.88173
32	0.89000	0.77073	-1.15497	-50.863	0.05065	32	0.61209	-1.00858	0.66283	-0.96857
33	0.92000	0.83736	-1.23614	-50.365	0.04292	33	0.68150	-1.09051	0.72669	-1.05432
34	0.95000	0.90399	-1.31583	-49.820	0.03468	34	0.75108	-1.17096	0.79037	-1.13898
35	0.97500	0.95952	-1.38102	-49.335	0.02742	35	0.82083	-1.24983	0.85389	-1.22246
36	1.00000	1.01505	-1.44509	-48.831	0.01998	36	0.89075	-1.32701	0.91724	-1.30464
						37	0.94912	-1.38996	0.96992	-1.37209
						38	1.00062	-1.44444	1.01634	-1.43072
						39	1.00702	-1.44761	1.01861	-1.43764
						40	1.01505	-1.44509	1.01505	-1.44509

CHORD 3.90043   CAMBER 4.985   STAGGER -55.289

PHASE II ROTOR

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 4

------ MEANLINE DATA ------

PT	PCT X	X	Y	B+M	T(M)
1	0.	-1.28603	1.73468	-52.556	0.01995
2	0.02500	-1.22629	1.65570	-53.227	0.02595
3	0.05000	-1.16654	1.57481	-53.867	0.03201
4	0.07500	-1.10680	1.49206	-54.470	0.03813
5	0.10000	-1.04706	.40751	-55.030	0.04425
6	0.12500	-0.98731	1.32127	-55.536	0.05034
7	0.15000	-0.92757	1.23348	-55.978	0.05637
8	0.17500	-0.86782	1.14434	-56.342	0.06230
9	0.20000	-0.80808	1.05413	-56.614	0.06806
10	0.23000	-0.73639	0.94488	-56.813	0.07471
11	0.26000	-0.66470	0.83510	-56.869	0.08096
12	0.29000	-0.59300	0.72538	-56.786	0.08674
13	0.32000	-0.52131	0.61629	-56.567	0.09199
14	0.35000	-0.44962	0.50835	-56.235	0.09662
15	0.38000	-0.37793	0.40193	-55.815	0.10058
16	0.41000	-0.30623	0.29731	-55.337	0.10384
17	0.44000	-0.23454	0.19460	-54.830	0.10636
18	0.47000	-0.16285	0.09381	-54.322	0.10814
19	0.50000	-0.09116	-0.00515	-53.838	0.10914
20	0.53000	-0.01946	-0.10243	-53.389	0.10935
21	0.56000	0.05223	-0.19819	-52.974	0.10877
22	0.59000	0.12392	-0.29255	-52.571	0.10740
23	0.62000	0.19561	-0.38553	-52.157	0.10528
24	0.65000	0.26731	-0.47711	-51.733	0.10242
25	0.68000	0.33900	-0.56731	-51.307	0.09883
26	0.71000	0.41069	-0.65515	-50.888	0.09454
27	0.74000	0.48238	-0.74369	-50.483	0.08956
28	0.77000	0.55408	-0.82999	-50.083	0.08391
29	0.80000	0.62577	-0.91507	-49.678	0.07763
30	0.83000	0.69746	-0.99892	-49.255	0.07071
31	0.86000	0.76915	-1.08149	-48.799	0.06318
32	0.89000	0.84085	-1.16266	-48.286	0.05506
33	0.92000	0.91254	-1.24228	-47.699	0.04639
34	0.95000	0.98423	-1.32018	-47.040	0.03715
35	0.97500	1.04397	-1.38368	-46.446	0.02901
36	1.00000	1.10372	-1.44584	-45.825	0.02064

------ SURFACE COORDINATES ------

PT	XS	YS	XP	YP
1	-1.28603	1.73468	-1.28603	1.73468
2	-1.29001	1.72754	-1.27791	1.73662
3	-1.28814	1.72053	-1.27182	1.73300
4	-1.23668	1.64793	-1.21589	1.66347
5	-1.17947	1.56538	-1.15361	1.58425
6	-1.12231	1.48098	-1.09129	1.50314
7	-1.06518	1.39483	-1.02893	1.42019
8	-1.00806	1.30702	-0.96656	1.33551
9	-0.95093	1.21771	-0.90421	1.24925
10	-0.89375	1.12708	-0.84190	1.16160
11	-0.83650	1.03540	-0.77966	1.07285
12	-0.76765	0.92443	-0.70513	0.96533
13	-0.69859	0.81298	-0.63080	0.85723
14	-0.62929	0.70162	-0.55672	0.74914
15	-0.55969	0.59095	-0.48293	0.64163
16	-0.48978	0.48150	-0.40946	0.53520
17	-0.41953	0.37368	-0.33632	0.43019
18	-0.34894	0.26778	-0.26353	0.32684
19	-0.27801	0.16396	-0.19107	0.22523
20	-0.20677	0.06227	-0.11893	0.12534
21	-0.13521	-0.03735	-0.04710	0.02705
22	-0.06335	-0.13504	0.02442	-0.06982
23	0.00881	-0.23094	0.09565	-0.16544
24	0.08128	-0.32519	0.16657	-0.25991
25	0.15404	-0.41782	0.23718	-0.35323
26	0.22710	-0.50882	0.30751	-0.44540
27	0.30043	-0.59820	0.37757	-0.53642
28	0.37401	-0.68597	0.44737	-0.62633
29	0.44784	-0.77219	0.51693	-0.71520
30	0.52190	-0.85692	0.58625	-0.80307
31	0.59617	-0.94019	0.65536	-0.88996
32	0.67067	-1.02200	0.72425	-0.97585
33	0.74539	-1.10229	0.79292	-1.06068
34	0.82030	-1.18098	0.86139	-1.14434
35	0.89538	-1.25789	0.92969	-1.22667
36	0.97064	-1.33284	0.99782	-1.30752
37	1.03346	-1.39367	1.05448	-1.37368
38	1.08877	-1.44598	1.10431	-1.43092
39	1.09554	-1.44889	1.10700	-1.43797
40	1.10372	-1.44584	1.10372	-1.44584

CHORD 3.97827   CAMBER 6.731   STAGGER -53.080

PHASE II ROTOR

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 5

NB 20

		MEANLINE DATA					SURFACE COORDINATES			
PT	PCT X	X	Y	B*M	T(M)	PT	XS	YS	XP	YP
1	0.	-1.36205	1.68972	-51.244	0.02022	1	-1.36205	1.68972	-1.36205	1.68972
2	0.02500	-1.29851	1.60978	-51.795	0.02754	2	-1.36594	1.68236	-1.35386	1.69190
3	0.05000	-1.23497	1.52827	-52.318	0.03491	3	-1.36390	1.67530	-1.34756	1.68839
4	0.07500	-1.17143	1.44528	-52.796	0.04232	4	-1.30933	1.60126	-1.28769	1.61829
5	0.10000	-1.10789	1.36092	-53.217	0.04971	5	-1.24878	1.51760	-1.22115	1.53895
6	0.12500	-1.04435	1.27536	-53.574	0.05703	6	-1.18828	1.43249	-1.15457	1.45808
7	0.15000	-0.98081	1.18879	-53.865	0.06424	7	-1.12779	1.34604	-1.08798	1.37581
8	0.17500	-0.91727	1.10138	-54.096	0.07129	8	-1.06729	1.25843	-1.02140	1.29230
9	0.20000	-0.85373	1.01331	-54.272	0.07811	9	-1.00675	1.16984	-0.95486	1.20773
10	0.23000	-0.77748	0.90703	-54.399	0.08594	10	-0.94614	1.08048	-0.88840	1.12228
11	0.26000	-0.70123	0.80047	-54.406	0.09328	11	-0.88543	0.99051	-0.82202	1.03612
12	0.29000	-0.62498	0.69421	-54.236	0.10004	12	-0.81242	0.88202	-0.74254	0.93204
13	0.32000	-0.54873	0.58904	-53.844	0.10611	13	-0.73916	0.77332	-0.66330	0.82762
14	0.35000	-0.47249	0.48573	-53.274	0.11143	14	-0.66557	0.66498	-0.58439	0.72344
15	0.38000	-0.39624	0.38475	-52.599	0.11595	15	-0.59157	0.55774	-0.50590	0.62034
16	0.41000	-0.31999	0.28628	-51.904	0.11964	16	-0.51714	0.45241	-0.42783	0.51905
17	0.44000	-0.24374	0.19015	-51.265	0.12247	17	-0.44229	0.34954	-0.35018	0.41997
18	0.47000	-0.16749	0.09609	-50.680	0.12444	18	-0.36707	0.24937	-0.27291	0.32319
19	0.50000	-0.09125	0.00391	-50.127	0.12551	19	-0.29151	0.15183	-0.19597	0.22846
20	0.53000	-0.01500	-0.08651	-49.599	0.12568	20	-0.21563	0.05666	-0.11936	0.13551
21	0.56000	0.06125	-0.17530	-49.094	0.12493	21	-0.13941	-0.03632	-0.04308	0.04415
22	0.59000	0.13750	-0.26256	-48.616	0.12329	22	-0.06285	-0.12724	0.03286	-0.04578
23	0.62000	0.21375	-0.34841	-48.168	0.12078	23	0.01404	-0.21620	0.10846	-0.13440
24	0.65000	0.29000	-0.43295	-47.742	0.11742	24	0.09125	-0.30331	0.18375	-0.22181
25	0.68000	0.36624	-0.51627	-47.330	0.11322	25	0.16875	-0.38869	0.25874	-0.30813
26	0.71000	0.44249	-0.59839	-46.920	0.10820	26	0.24654	-0.47243	0.33345	-0.39347
27	0.74000	0.51874	-0.67934	-46.503	0.10238	27	0.32462	-0.55464	0.40787	-0.47790
28	0.77000	0.59499	-0.75911	-46.077	0.09578	28	0.40298	-0.63535	0.48201	-0.56144
29	0.80000	0.67124	-0.83768	-45.640	0.08841	29	0.48161	-0.71458	0.55587	-0.64411
30	0.83000	0.74748	-0.91504	-45.190	0.08029	30	0.56049	-0.79233	0.62948	-0.72589
31	0.86000	0.82373	-0.99118	-44.725	0.07143	31	0.63963	-0.86859	0.70284	-0.80677
32	0.89000	0.89998	-1.06608	-44.243	0.06186	32	0.71900	-0.94334	0.77597	-0.88675
33	0.92000	0.97623	-1.13969	-43.741	0.05161	33	0.79860	-1.01656	0.84886	-0.96581
34	0.95000	1.05248	-1.21201	-43.221	0.04062	34	0.87840	-1.08823	0.92156	-1.04392
35	0.97500	1.11602	-1.27125	-42.774	0.03089	35	0.95839	-1.15833	0.99407	-1.12105
36	1.00000	1.17956	-1.32958	-42.318	0.02088	36	1.03857	-1.22681	1.06638	-1.19721
						37	1.10553	-1.28259	1.12651	-1.25992
						38	1.16441	-1.33072	1.17930	-1.31440
						39	1.17149	-1.33319	1.18242	-1.32136
						40	1.17956	-1.32958	1.17956	-1.32958

CHORD 3.94663 CAMBER 8.926 STAGGER -49.910

PHASE II ROTOR

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 6

NB 20

		MEANLINE DATA						SURFACE COORDINATES		
PT	PCT X	X	Y	B+M	T(M)	PT	XS	YS	XP	YP
1	0.	-1.43381	1.62645	-49.905	0.02033	1	-1.43381	1.62645	-1.43381	1.62645
2	0.02500	-1.36676	1.54618	-50.347	0.02960	2	-1.43758	1.61892	-1.42562	1.62886
3	0.05000	-1.29971	1.46468	-50.756	0.03892	3	-1.43540	1.61195	-1.41915	1.62551
4	0.07500	-1.23266	1.38207	-51.104	0.04824	4	-1.37815	1.53674	-1.35537	1.55563
5	0.10000	-1.16562	1.29856	-51.365	0.05749	5	-1.31478	1.45237	-1.28464	1.47699
6	0.12500	-1.09857	1.21440	-51.535	0.05661	6	-1.25144	1.36693	-1.21389	1.39722
7	0.15000	-1.03152	1.12985	-51.619	0.07555	7	-1.18807	1.28061	-1.14316	1.31651
8	0.17500	-0.96447	1.04515	-51.646	0.08422	8	-1.12465	1.19368	-1.07249	1.23511
9	0.20000	-0.89742	0.96042	-51.642	0.09257	9	-1.06113	1.10640	-1.00191	1.15331
10	0.23000	-0.81697	0.85882	-51.592	0.10207	10	-0.99749	1.01902	-0.93145	1.07128
11	0.26000	-0.73651	0.75755	-51.458	0.11093	11	-0.93372	0.93170	-0.86113	0.98914
12	0.29000	-0.65605	0.65703	-51.152	0.11905	12	-0.85696	0.82712	-0.77698	0.89053
13	0.32000	-0.57559	0.55805	-50.596	0.12633	13	-0.77989	0.72299	-0.69313	0.79211
14	0.35000	-0.49514	0.46137	-49.839	0.13267	14	-0.70241	0.61970	-0.60969	0.69437
15	0.38000	-0.41468	0.36747	-48.967	0.13803	15	-0.62440	0.51796	-0.52679	0.59815
16	0.41000	-0.33422	0.27645	-48.087	0.14238	16	-0.54583	0.41859	-0.44444	0.50416
17	0.44000	-0.25376	0.18808	-47.295	0.14571	17	-0.46674	0.32216	-0.36262	0.41278
18	0.47000	-0.17331	0.10199	-46.588	0.14798	18	-0.38720	0.22890	-0.28124	0.32401
19	0.50000	-0.09285	0.01792	-45.939	0.14919	19	-0.30730	0.13867	-0.20023	0.23749
20	0.53000	-0.01239	-0.06434	-45.333	0.14931	20	-0.22706	0.05114	-0.11956	0.15284
21	0.56000	0.06807	-0.14493	-44.761	0.14835	21	-0.14645	-0.03396	-0.03925	0.06979
22	0.59000	0.14852	-0.22395	-44.212	0.14633	22	-0.06549	-0.11682	0.04070	-0.01186
23	0.62000	0.22898	-0.30150	-43.676	0.14325	23	0.01583	-0.19759	0.12030	-0.09226
24	0.65000	0.30944	-0.37762	-43.153	0.13916	24	0.09751	-0.27639	0.19954	-0.17151
25	0.68000	0.38990	-0.45238	-42.646	0.13408	25	0.17952	-0.35330	0.27844	-0.24969
26	0.71000	0.47035	-0.52585	-42.159	0.12801	26	0.26185	-0.42838	0.35703	-0.32686
27	0.74000	0.55081	-0.59811	-41.696	0.12098	27	0.34448	-0.50169	0.43531	-0.40307
28	0.77000	0.63127	-0.66923	-41.257	0.11299	28	0.42739	-0.57330	0.51331	-0.47840
29	0.80000	0.71173	-0.73928	-40.842	0.10407	29	0.51057	-0.64327	0.59105	-0.55294
30	0.83000	0.79218	-0.80835	-40.450	0.09420	30	0.59401	-0.71170	0.66852	-0.62675
31	0.86000	0.87264	-0.87650	-40.077	0.08340	31	0.67770	-0.77865	0.74576	-0.69992
32	0.89000	0.95310	-0.94376	-39.715	0.07171	32	0.76162	-0.84420	0.82274	-0.77251
33	0.92000	1.03356	-1.01017	-39.358	0.05914	33	0.84579	-0.90841	0.89949	-0.84459
34	0.95000	1.11401	-1.07574	-39.002	0.04558	34	0.93019	-0.97134	0.97601	-0.91618
35	0.97500	1.18106	-1.12975	-38.704	0.03351	35	1.01480	-1.03303	1.05231	-0.98730
36	1.00000	1.24811	-1.18319	-38.404	0.02105	36	1.09967	-1.09345	1.12836	-1.05803
						37	1.17058	-1.14283	1.19154	-1.11667
						38	1.23286	-1.18551	1.24691	-1.16782
						39	1.24023	-1.18743	1.25046	-1.17465
						40	1.24811	-1.18319	1.24811	-1.18319

CHORD 3.88416   CAMBER 11.501   STAGGER -46.332

PHASE II ROTOR

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 7

MEANLINE DATA

PT	PCT X	X	Y	B*M	T(M)
1	0.	-1.50486	1.54402	-48.534	0.01995
2	0.02500	-1.43445	1.46399	-48.782	0.03226
3	0.05000	-1.36404	1.38328	-49.010	0.04459
4	0.07500	-1.29363	1.30197	-49.200	0.05688
5	0.10000	-1.22322	1.22019	-49.333	0.06904
6	0.12500	-1.15281	1.13812	-49.398	0.08098
7	0.15000	-1.08239	1.05597	-49.389	0.09262
8	0.17500	-1.01198	0.97396	-49.303	0.10387
9	0.20000	-0.94157	0.89230	-49.140	0.11467
10	0.23000	-0.85708	0.79512	-48.831	0.12689
11	0.26000	-0.77258	0.69921	-48.382	0.13822
12	0.29000	-0.68809	0.60509	-47.751	0.14852
13	0.32000	-0.60360	0.51337	-46.911	0.15769
14	0.35000	-0.51910	0.42456	-45.922	0.16566
15	0.38000	-0.43461	0.33887	-44.879	0.17236
16	0.41000	-0.35012	0.25620	-43.889	0.17779
17	0.44000	-0.26562	0.17614	-43.041	0.18193
18	0.47000	-0.18113	0.09827	-42.300	0.18476
19	0.50000	-0.09663	0.02233	-41.600	0.18624
20	0.53000	-0.01214	-0.05179	-40.911	0.18635
21	0.56000	0.07235	-0.12412	-40.221	0.18509
22	0.59000	0.15685	-0.19472	-39.543	0.18247
23	0.62000	0.24134	-0.26367	-38.899	0.17854
24	0.65000	0.32583	-0.33111	-38.292	0.17331
25	0.68000	0.41033	-0.39714	-37.726	0.16681
26	0.71000	0.49482	-0.46187	-37.199	0.15906
27	0.74000	0.57931	-0.52544	-36.712	0.15007
28	0.77000	0.66381	-0.58792	-36.256	0.13985
29	0.80000	0.74830	-0.64939	-35.823	0.12840
30	0.83000	0.83280	-0.70992	-35.413	0.11574
31	0.86000	0.91729	-0.76956	-35.031	0.10186
32	0.89000	1.00178	-0.82842	-34.694	0.08680
33	0.92000	1.08628	-0.88659	-34.413	0.07058
34	0.95000	1.17077	-0.94422	-34.181	0.05303
35	0.97500	1.24118	-0.99188	-34.012	0.03735
36	1.00000	1.31159	-1.03925	-33.854	0.02115

SURFACE COORDINATES

PT	XS	YS	XP	YP
1	-1.50486	1.54402	-1.50486	1.54402
2	-1.50843	1.53648	-1.49687	1.54662
3	-1.50618	1.52957	-1.49036	1.54354
4	-1.44659	1.45336	-1.42232	1.47462
5	-1.36087	1.36865	-1.34721	1.39790
6	-1.31516	1.28338	-1.27210	1.32055
7	-1.24940	1.19769	-1.19704	1.24268
8	-1.18355	1.11177	-1.12206	1.16447
9	-1.11755	1.02583	-1.04724	1.08611
10	-1.05136	0.94009	-0.97261	1.00782
11	-0.98493	0.85480	-0.89821	0.92981
12	-0.90484	0.75335	-0.80932	0.83688
13	-0.82425	0.65331	-0.72092	0.74511
14	-0.74306	0.55516	-0.63312	0.65502
15	-0.66118	0.45951	-0.54602	0.56723
16	-0.57861	0.36694	-0.45960	0.48218
17	-0.49542	0.27780	-0.37380	0.39994
18	-0.41174	0.19213	-0.28849	0.32026
19	-0.32771	0.10966	-0.20354	0.24263
20	-0.24330	0.02994	-0.11896	0.16660
21	-0.15846	-0.04731	-0.03481	0.09196
22	-0.07316	-0.12220	0.04888	0.01863
23	0.01259	-0.19478	0.13211	-0.05346
24	0.09876	-0.26507	0.21493	-0.12436
25	0.18528	-0.33315	0.29740	-0.19420
26	0.27214	-0.39912	0.37953	-0.26310
27	0.35929	-0.46311	0.46136	-0.33116
28	0.44674	-0.52522	0.54290	-0.39852
29	0.53446	-0.58559	0.62417	-0.46528
30	0.62245	-0.64430	0.70516	-0.53153
31	0.71073	-0.70145	0.78588	-0.59733
32	0.79926	-0.75708	0.86633	-0.66276
33	0.88805	-0.81127	0.94652	-0.72786
34	0.97708	-0.86410	1.02649	-0.79273
35	1.06633	-0.91571	1.10622	-0.85748
36	1.15588	-0.96615	1.18567	-0.92228
37	1.23073	-1.00736	1.25163	-0.97640
38	1.29639	-1.04301	1.30931	-1.02377
39	1.30401	-1.04422	1.31333	-1.03041
40	1.31159	-1.03925	1.31159	-1.03925

CHORD 3.82174   CAMBER 14.680   STAGGER -42.527

PHASE II ROTOR

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 8

NB 20

MEANLINE DATA

PT	PCT X	X	Y	B*M	T(M)
1	0.	-1.57422	1.44185	-47.190	0.01902
2	0.02500	-1.50058	1.36221	-47.288	0.03435
3	0.05000	-1.42694	1.28232	-47.371	0.04963
4	0.07500	-1.35330	1.20223	-47.424	0.06479
5	0.10000	-1.27965	1.12205	-47.433	0.07974
6	0.12500	-1.20601	1.04193	-47.378	0.09437
7	0.15000	-1.13237	0.96209	-47.230	0.10856
8	0.17500	-1.05873	0.88284	-46.943	0.12223
9	0.20000	-0.98508	0.80463	-46.472	0.13528
10	0.23000	-0.89671	0.71283	-45.665	0.14996
11	0.26000	-0.80834	0.62395	-44.626	0.16342
12	0.29000	-0.71997	0.53846	-43.465	0.17556
13	0.32000	-0.63160	0.45638	-42.306	0.18633
14	0.35000	-0.54323	0.37750	-41.202	0.19568
15	0.38000	-0.45486	0.30155	-40.166	0.20359
16	0.41000	-0.36649	0.22823	-39.211	0.21002
17	0.44000	-0.27812	0.15726	-38.335	0.21494
18	0.47000	-0.18975	0.08841	-37.511	0.21832
19	0.50000	-0.10137	0.02156	-36.704	0.22010
20	0.53000	-0.01300	-0.04336	-35.902	0.22026
21	0.56000	0.07537	-0.10641	-35.104	0.21878
22	0.59000	0.16374	-0.16763	-34.333	0.21569
23	0.62000	0.25211	-0.22717	-33.616	0.21103
24	0.65000	0.34048	-0.28518	-32.949	0.20482
25	0.68000	0.42885	-0.34176	-32.323	0.19707
26	0.71000	0.51722	-0.39703	-31.725	0.18781
27	0.74000	0.60559	-0.45105	-31.151	0.17705
28	0.77000	0.69396	-0.50390	-30.619	0.16480
29	0.80000	0.78234	-0.55570	-30.152	0.15107
30	0.83000	0.87071	-0.60662	-29.758	0.13584
31	0.86000	0.95908	-0.65680	-29.434	0.11911
32	0.89000	1.04745	-0.70639	-29.167	0.10091
33	0.92000	1.13582	-0.75548	-28.941	0.08125
34	0.95000	1.22419	-0.80414	-28.744	0.05994
35	0.97500	1.29783	-0.84440	-28.593	0.04088
36	1.00000	1.37148	-0.88442	-28.449	0.02116

SURFACE COORDINATES

PT	XS	YS	XP	YP
1	-1.57422	1.44185	-1.57422	1.44185
2	-1.57749	1.43452	-1.56665	1.44455
3	-1.57525	1.42797	-1.56031	1.44181
4	-1.51320	1.35056	-1.48796	1.37386
5	-1.44520	1.26551	-1.40868	1.29913
6	-1.37715	1.18031	-1.32944	1.22415
7	-1.30902	1.09508	-1.25029	1.14902
8	-1.24073	1.00998	-1.17129	1.07389
9	-1.17222	0.92523	-1.09252	0.99895
10	-1.10338	0.84112	-1.01407	0.92457
11	-1.03413	0.75804	-0.93604	0.85121
12	-0.95034	0.66043	-0.84308	0.76523
13	-0.86574	0.56580	-0.75094	0.68210
14	-0.78036	0.47475	-0.65959	0.60217
15	-0.69431	0.38748	-0.56889	0.52528
16	-0.60768	0.30389	-0.47878	0.45112
17	-0.52052	0.22376	-0.38920	0.37934
18	-0.43287	0.14686	-0.30010	0.30959
19	-0.34478	0.07296	-0.21146	0.24156
20	-0.25621	0.00182	-0.12328	0.17500
21	-0.16715	-0.06667	-0.03560	0.10979
22	-0.07758	-0.13257	0.05158	0.04584
23	0.01246	-0.19590	0.13827	-0.01691
24	0.10291	-0.25669	0.22456	-0.07858
25	0.19369	-0.31504	0.31052	-0.13930
26	0.28478	-0.37111	0.39618	-0.19924
27	0.37617	-0.42503	0.48154	-0.25850
28	0.46784	-0.47691	0.56660	-0.31716
29	0.55980	-0.52681	0.65139	-0.37529
30	0.65200	-0.57481	0.73593	-0.43299
31	0.74439	-0.62102	0.82028	-0.49039
32	0.83700	-0.66558	0.90442	-0.54766
33	0.92981	-0.70867	0.98834	-0.60494
34	1.02286	-0.75044	1.07204	-0.66233
35	1.11616	-0.79103	1.15548	-0.71992
36	1.20978	-0.83042	1.23860	-0.77786
37	1.28805	-0.86235	1.30761	-0.82646
38	1.35660	-0.88981	1.36787	-0.86902
39	1.36435	-0.89018	1.37242	-0.87537
40	1.37148	-0.88442	1.37148	-0.88442

CHORD   3.75349   CAMBER   18.741   STAGGER   -38.299

55

PHASE II ROTOR

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 9

NR 20

		MEANLINE DATA					SURFACE COORDINATES			
PT	PCT X	X	Y	B·M	T(M)	PT	XS	YS	XP	YP
1	0.	-1.62875	1.30554	-45.785	0.01859	1	-1.62875	1.30554	-1.62875	1.30554
2	0.02500	-1.55200	1.22676	-45.700	0.03674	2	-1.63181	1.29824	-1.62141	1.30839
3	0.05000	-1.47524	1.14825	-45.586	0.05479	3	-1.62950	1.29189	-1.61509	1.30591
4	0.07500	-1.39848	1.07012	-45.413	0.07262	4	-1.56514	1.21393	-1.53885	1.23959
5	0.10000	-1.32172	0.99258	-45.152	0.09011	5	-1.49481	1.12908	-1.45567	1.16742
6	0.12500	-1.24496	0.91588	-44.781	0.10715	6	-1.42434	1.04463	-1.37262	1.09561
7	0.15000	-1.16820	0.84034	-44.281	0.12362	7	-1.35366	0.96080	-1.28977	1.02435
8	0.17500	-1.09144	0.76629	-43.632	0.13940	8	-1.28270	0.87785	-1.20722	0.95391
9	0.20000	-1.01468	0.69411	-42.819	0.15439	9	-1.21135	0.79608	-1.12504	0.88459
10	0.23000	-0.92257	0.61043	-41.647	0.17117	10	-1.13953	0.71584	-1.04334	0.81674
11	0.26000	-0.83046	0.53039	-40.310	0.18651	11	-1.06715	0.63748	-0.96221	0.75073
12	0.29000	-0.73835	0.45412	-38.943	0.20035	12	-0.97944	0.54648	-0.86569	0.67439
13	0.32000	-0.64623	0.38136	-37.687	0.21265	13	-0.89079	0.45928	-0.77013	0.60150
14	0.35000	-0.55412	0.31166	-36.569	0.22337	14	-0.80131	0.37621	-0.67538	0.53204
15	0.38000	-0.46201	0.24458	-35.570	0.23248	15	-0.71124	0.29722	-0.58173	0.46551
16	0.41000	-0.36990	0.17983	-34.649	0.23994	16	-0.62066	0.22196	-0.48758	0.40135
17	0.44000	-0.27779	0.11722	-33.758	0.24569	17	-0.52963	0.15003	-0.39439	0.33913
18	0.47000	-0.18568	0.05667	-32.878	0.24968	18	-0.43811	0.08114	-0.30169	0.27852
19	0.50000	-0.09357	-0.00187	-31.997	0.25183	19	-0.34605	0.01509	-0.20953	0.21935
20	0.53000	-0.00145	-0.05844	-31.108	0.25211	20	-0.25345	-0.04817	-0.11791	0.16152
21	0.56000	0.09066	-0.11304	-30.208	0.25049	21	-0.16029	-0.10865	-0.02685	0.10492
22	0.59000	0.18277	-0.16570	-29.309	0.24699	22	-0.06658	-0.16636	0.06367	0.04949
23	0.62000	0.27488	-0.21648	-28.425	0.24166	23	0.02764	-0.22127	0.15367	-0.00480
24	0.65000	0.36699	-0.26544	-27.566	0.23452	24	0.12231	-0.27339	0.24322	-0.05802
25	0.68000	0.45910	-0.31269	-26.743	0.22560	25	0.21736	-0.32275	0.33240	-0.11022
26	0.71000	0.55121	-0.35831	-25.966	0.21491	26	0.31272	-0.36940	0.42126	-0.16149
27	0.74000	0.64332	-0.40245	-25.245	0.20246	27	0.40834	-0.41342	0.50986	-0.21195
28	0.77000	0.73544	-0.44522	-24.588	0.18828	28	0.50417	-0.45492	0.59826	-0.26170
29	0.80000	0.82755	-0.48679	-23.999	0.17234	29	0.60015	-0.49401	0.68650	-0.31088
30	0.83000	0.91966	-0.52729	-23.482	0.15466	30	0.69627	-0.53083	0.77461	-0.35962
31	0.86000	1.01177	-0.56688	-23.038	0.13521	31	0.79250	-0.56551	0.86260	-0.40807
32	0.89000	1.10388	-0.60568	-22.666	0.11405	32	0.88885	-0.59822	0.95047	-0.45637
33	0.92000	1.19599	-0.64385	-22.360	0.09117	33	0.98531	-0.62909	1.03823	-0.50466
34	0.95000	1.28810	-0.68150	-22.106	0.06634	34	1.08191	-0.65830	1.12585	-0.55306
35	0.97500	1.36486	-0.71253	-21.921	0.04411	35	1.17865	-0.68601	1.21333	-0.60169
36	1.00000	1.44162	-0.74328	-21.748	0.02111	36	1.27562	-0.71223	1.30059	-0.65077
						37	1.35663	-0.73299	1.37310	-0.69207
						38	1.42746	-0.75057	1.43637	-0.72825
						39	1.43520	-0.74991	1.44155	-0.73412
						40	1.44162	-0.74328	1.44162	-0.74328

CHORD   3.69119   CAMBER   24.038   STAGGER   -33.715

PHASE II ROTOR

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 10

NB 20

------- MEANLINE DATA -------

PT	PCT X	X	Y	B*M	T(M)
1	0.	-1.63125	1.12563	-44.072	0.02096
2	0.02500	-1.55191	1.04917	-43.807	0.04141
3	0.05000	-1.47257	0.97347	-43.483	0.06167
4	0.07500	-1.39323	0.89878	-43.032	0.08161
5	0.10000	-1.31388	0.82549	-42.385	0.10110
6	0.12500	-1.23454	0.75410	-41.530	0.11998
7	0.15000	-1.15520	0.68510	-40.465	0.13812
8	0.17500	-1.07586	0.61882	-39.272	0.15539
9	0.20000	-0.99652	0.55534	-38.047	0.17171
10	0.23000	-0.90131	0.48275	-36.605	0.18997
11	0.26000	-0.80610	0.41378	-35.248	0.20674
12	0.29000	-0.71089	0.34808	-33.978	0.22196
13	0.32000	-0.61568	0.28536	-32.780	0.23558
14	0.35000	-0.52047	0.22538	-31.644	0.24752
15	0.38000	-0.42526	0.16795	-30.559	0.25772
16	0.41000	-0.33005	0.11291	-29.505	0.26610
17	0.44000	-0.23484	0.06017	-28.464	0.27262
18	0.47000	-0.13963	0.00966	-27.418	0.27719
19	0.50000	-0.04442	-0.03861	-26.351	0.27974
20	0.53000	0.05079	-0.08465	-25.253	0.28023
21	0.56000	0.14600	-0.12842	-24.118	0.27861
22	0.59000	0.24121	-0.16989	-22.945	0.27490
23	0.62000	0.33642	-0.20903	-21.742	0.26914
24	0.65000	0.43163	-0.24584	-20.540	0.26135
25	0.68000	0.52684	-0.28041	-19.377	0.25155
26	0.71000	0.62205	-0.31288	-18.295	0.23975
27	0.74000	0.71726	-0.34345	-17.327	0.22595
28	0.77000	0.81247	-0.37237	-16.484	0.21015
29	0.80000	0.90768	-0.39987	-15.765	0.19235
30	0.83000	1.00289	-0.42619	-15.162	0.17253
31	0.86000	1.09810	-0.45154	-14.662	0.15066
32	0.89000	1.19331	-0.47606	-14.238	0.12678
33	0.92000	1.28852	-0.49988	-13.861	0.10088
34	0.95000	1.38373	-0.52307	-13.516	0.07266
35	0.97500	1.46308	-0.54194	-13.241	0.04733
36	1.00000	1.54242	-0.56041	-12.971	0.02108

------- SURFACE COORDINATES -------

PT	XS	YS	XP	YP
1	-1.63125	1.12563	-1.63125	1.12563
2	-1.63448	1.11724	-1.62307	1.12913
3	-1.63171	1.11014	-1.61580	1.12660
4	-1.56624	1.03422	-1.53758	1.06411
5	-1.49379	0.95110	-1.45135	0.99584
6	-1.42107	0.86895	-1.36538	0.92860
7	-1.34796	0.78815	-1.27981	0.86283
8	-1.27432	0.70919	-1.19477	0.79902
9	-1.20002	0.63256	-1.11038	0.73764
10	-1.12504	0.55867	-1.02668	0.67896
11	-1.04943	0.48773	-0.94361	0.62295
12	-0.95795	0.40650	-0.84467	0.55900
13	-0.86575	0.32936	-0.74644	0.49819
14	-0.77291	0.25605	-0.64886	0.44011
15	-0.67945	0.18633	-0.55190	0.38439
16	-0.58540	0.12002	-0.45554	0.33074
17	-0.49077	0.05699	-0.35974	0.27891
18	-0.39558	-0.00288	-0.26452	0.22871
19	-0.29980	-0.05966	-0.16987	0.18000
20	-0.20345	-0.11336	-0.07581	0.13269
21	-0.10650	-0.16395	0.01767	0.08673
22	-0.00898	-0.21137	0.11057	0.04207
23	0.08908	-0.25556	0.20293	-0.00128
24	0.18763	-0.29647	0.29480	-0.04331
25	0.28657	-0.33403	0.38627	-0.08403
26	0.38579	-0.36821	0.47748	-0.12345
27	0.48511	-0.39906	0.56857	-0.16176
28	0.58442	-0.42669	0.65968	-0.19906
29	0.68362	-0.45130	0.75091	-0.23560
30	0.78266	-0.47312	0.84229	-0.27161
31	0.88155	-0.49243	0.93381	-0.30731
32	0.98033	-0.50945	1.02546	-0.34293
33	1.07904	-0.52441	1.11717	-0.37866
34	1.17772	-0.53751	1.20891	-0.41462
35	1.27644	-0.54885	1.30061	-0.45091
36	1.37524	-0.55839	1.39223	-0.48774
37	1.45766	-0.56497	1.46850	-0.51890
38	1.52952	-0.56999	1.53503	-0.54615
39	1.53706	-0.56803	1.54100	-0.55129
40	1.54242	-0.56041	1.54242	-0.56041

CHORD 3.59373   CAMBER 31.101   STAGGER -27.980

PHASE II ROTOR

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 11

NB 20

------- MEANLINE DATA -------

PT	PCT X	X	Y	B'M	T(M)
1	0.	-1.62361	0.91123	-41.550	0.02583
2	0.02500	-1.54216	0.83968	-41.041	0.04770
3	0.05000	-1.46071	0.76945	-40.474	0.06935
4	0.07500	-1.37925	0.70075	-39.788	0.09063
5	0.10000	-1.29780	0.63391	-38.929	0.11142
6	0.12500	-1.21634	0.56930	-37.880	0.13155
7	0.15000	-1.13489	0.50729	-36.649	0.15090
8	0.17500	-1.05344	0.44814	-35.309	0.16936
9	0.20000	-0.97198	0.39189	-33.948	0.18685
10	0.23000	-0.87424	0.32806	-32.343	0.20650
11	0.26000	-0.77649	0.26800	-30.799	0.22459
12	0.29000	-0.67875	0.21148	-29.281	0.24106
13	0.32000	-0.58100	0.15837	-27.747	0.25583
14	0.35000	-0.48326	0.10860	-26.222	0.26884
15	0.38000	-0.38552	0.06202	-24.747	0.28001
16	0.41000	-0.28777	0.01841	-23.364	0.28928
17	0.44000	-0.19003	-0.02253	-22.092	0.29658
18	0.47000	-0.09228	-0.06100	-20.876	0.30183
19	0.50000	0.00546	-0.09709	-19.650	0.30496
20	0.53000	0.10321	-0.13079	-18.393	0.30590
21	0.56000	0.20095	-0.16208	-17.103	0.30460
22	0.59000	0.29870	-0.19096	-15.821	0.30104
23	0.62000	0.39644	-0.21751	-14.577	0.29523
24	0.65000	0.49419	-0.24182	-13.356	0.28717
25	0.68000	0.59193	-0.26393	-12.129	0.27684
26	0.71000	0.68967	-0.28382	-10.870	0.26424
27	0.74000	0.78742	-0.30144	-9.570	0.24935
28	0.77000	0.88516	-0.31678	-8.274	0.23217
29	0.80000	0.98291	-0.32991	-7.031	0.21271
30	0.83000	1.08065	-0.34094	-5.852	0.19088
31	0.86000	1.17840	-0.34999	-4.740	0.16666
32	0.89000	1.27614	-0.35717	-3.668	0.14013
33	0.92000	1.37389	-0.36253	-2.609	0.11128
34	0.95000	1.47163	-0.36608	-1.545	0.07971
35	0.97500	1.55308	-0.36763	-0.646	0.05120
36	1.00000	1.63454	-0.36791	0.259	0.02159

------- SURFACE COORDINATES -------

PT	XS	YS	XP	YP
1	-1.62361	0.91123	-1.62361	0.91123
2	-1.62716	0.90065	-1.61375	0.91602
3	-1.62340	0.89207	-1.60458	0.91336
4	-1.55782	0.82169	-1.52650	0.85766
5	-1.48321	0.74308	-1.43820	0.79583
6	-1.40825	0.66593	-1.35025	0.73558
7	-1.33280	0.59057	-1.26279	0.67724
8	-1.25673	0.51738	-1.17596	0.62121
9	-1.17993	0.44676	-1.08986	0.56782
10	-1.10238	0.37904	-1.00449	0.51724
11	-1.02416	0.31439	-0.91981	0.46939
12	-0.92947	0.24083	-0.81900	0.41529
13	-0.83399	0.17155	-0.71900	0.36446
14	-0.73770	0.10635	-0.61980	0.31660
15	-0.64056	0.04516	-0.52145	0.27157
16	-0.54265	-0.01199	-0.42387	0.22919
17	-0.44412	-0.06513	-0.32691	0.18917
18	-0.34513	-0.11438	-0.23041	0.15119
19	-0.24580	-0.15993	-0.13426	0.11488
20	-0.14606	-0.20200	-0.03850	0.08001
21	-0.04581	-0.24068	0.05674	0.04651
22	0.05495	-0.27593	0.15147	0.01434
23	0.15616	-0.30764	0.24574	-0.01652
24	0.25766	-0.33578	0.33973	-0.04614
25	0.35929	-0.36038	0.43359	-0.07464
26	0.46102	-0.38152	0.52735	-0.10212
27	0.56285	-0.39926	0.62101	-0.12860
28	0.66476	-0.41357	0.71459	-0.15407
29	0.76669	-0.42438	0.80814	-0.17851
30	0.86846	-0.43166	0.90187	-0.20191
31	0.96989	-0.43546	0.99593	-0.22436
32	1.07092	-0.43588	1.09038	-0.24599
33	1.17151	-0.43303	1.18528	-0.26694
34	1.27166	-0.42709	1.28062	-0.28725
35	1.37135	-0.41811	1.37642	-0.30695
36	1.47056	-0.40591	1.47270	-0.32624
37	1.55280	-0.39323	1.55337	-0.34204
38	1.62394	-0.38069	1.62389	-0.35521
39	1.63091	-0.37695	1.63108	-0.35915
40	1.63454	-0.36791	1.63454	-0.36791

CHORD 3.50025   CAMBER 41.810   STAGGER -21.435

58

PHASE II ROTOR

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 12

NB 20

--------- MEANLINE DATA ---------						------- SURFACE COORDINATES -------			
PT	PCT X	X	Y	B*M	T(M)	PT	XS	YS	XP	YP
1	0.	-1.64725	0.79648	-38.346	0.03490	1	-1.64725	0.79648	-1.64725	0.79648
2	0.02500	-1.56471	0.73180	-37.815	0.05637	2	-1.65123	0.78193	-1.63431	0.80370
3	0.05000	-1.48217	0.66841	-37.223	0.07768	3	-1.64552	0.77063	-1.62173	0.80083
4	0.07500	-1.39963	0.60648	-36.514	0.09869	4	-1.58199	0.70954	-1.54743	0.75407
5	0.10000	-1.31710	0.54632	-35.636	0.11926	5	-1.50567	0.63748	-1.45868	0.69934
6	0.12500	-1.23456	0.48826	-34.575	0.13925	6	-1.42900	0.56682	-1.37027	0.64614
7	0.15000	-1.15202	0.43264	-33.343	0.15852	7	-1.35184	0.49785	-1.28236	0.59478
8	0.17500	-1.06949	0.37968	-32.027	0.17700	8	-1.27407	0.43093	-1.19505	0.54558
9	0.20000	-0.98695	0.32935	-30.721	0.19459	9	-1.19559	0.36643	-1.10846	0.49886
10	0.23000	-0.88790	0.27225	-29.224	0.21448	10	-1.11642	0.30465	-1.02255	0.45471
11	0.26000	-0.78886	0.21843	-27.821	0.23294	11	-1.03665	0.24571	-0.93724	0.41300
12	0.29000	-0.68981	0.16768	-26.425	0.24985	12	-0.94026	0.17866	-0.83555	0.36584
13	0.32000	-0.59077	0.12002	-24.961	0.26513	13	-0.84322	0.11542	-0.73450	0.32143
14	0.35000	-0.49172	0.07548	-23.453	0.27870	14	-0.74541	0.05581	-0.63422	0.27956
15	0.38000	-0.39268	0.03404	-21.956	0.29047	15	-0.64671	-0.00017	-0.53483	0.24020
16	0.41000	-0.29363	-0.00444	-20.531	0.30037	16	-0.54719	-0.05235	-0.43626	0.20332
17	0.44000	-0.19459	-0.04023	-19.215	0.30829	17	-0.44698	-0.10066	-0.33838	0.16875
18	0.47000	-0.09555	-0.07354	-17.963	0.31417	18	-0.34631	-0.14509	-0.24096	0.13620
19	0.50000	-0.00350	-0.10447	-16.722	0.31793	19	-0.24532	-0.18579	-0.14386	0.10533
20	0.53000	0.10254	-0.13305	-15.461	0.31948	20	-0.14399	-0.22297	-0.04710	0.07589
21	0.56000	0.20159	-0.15924	-14.156	0.31874	21	-0.04224	-0.25671	0.04924	0.04777
22	0.59000	0.30063	-0.18298	-12.791	0.31571	22	0.05996	-0.28701	0.14513	0.02091
23	0.62000	0.39968	-0.20418	-11.359	0.31039	23	0.16261	-0.31377	0.24056	-0.00471
24	0.65000	0.49872	-0.22275	-9.869	0.30280	24	0.26569	-0.33692	0.33558	-0.02905
25	0.68000	0.59777	-0.23863	-8.333	0.29295	25	0.36911	-0.35634	0.43025	-0.05203
26	0.71000	0.69681	-0.25176	-6.763	0.28083	26	0.47277	-0.37191	0.52467	-0.07359
27	0.74000	0.79586	-0.26211	-5.178	0.26643	27	0.57654	-0.38356	0.61900	-0.09370
28	0.77000	0.89490	-0.26972	-3.617	0.24976	28	0.68028	-0.39119	0.71335	-0.11232
29	0.80000	0.99395	-0.27467	-2.103	0.23080	29	0.78383	-0.39479	0.80788	-0.12344
30	0.83000	1.09299	-0.27702	-0.628	0.20952	30	0.88703	-0.39435	0.90278	-0.14510
31	0.86000	1.19204	-0.27684	0.844	0.18592	31	0.98971	-0.38999	0.99818	-0.15935
32	0.89000	1.29108	-0.27405	2.402	0.16007	32	1.09184	-0.38178	1.09414	-0.17227
33	0.92000	1.39013	-0.26843	4.124	0.13189	33	1.19341	-0.36979	1.19067	-0.18389
34	0.95000	1.48917	-0.25967	6.017	0.10088	34	1.29444	-0.35402	1.28773	-0.19409
35	0.97500	1.57171	-0.24974	7.710	0.07271	35	1.39487	-0.33421	1.38538	-0.20266
36	1.00000	1.65425	-0.23729	9.450	0.04338	36	1.49446	-0.30983	1.48388	-0.20951
						37	1.57659	-0.28577	1.56683	-0.21371
						38	1.63711	-0.26588	1.62921	-0.21557
						39	1.64968	-0.25656	1.64486	-0.22122
						40	1.65425	-0.23729	1.65425	-0.23729

CHORD 3.45956   CAMBER 47.795   STAGGER -17.387

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 13

------------------ MEANLINE DATA ------------------

PT	PCT X	X	Y	B*M	T(M)
1	0.	-1.68416	0.69934	-32.373	0.05296
2	0.02500	-1.60035	0.64642	-32.158	0.07285
3	0.05000	-1.51654	0.59399	-31.881	0.09277
4	0.07500	-1.43273	0.54222	-31.500	0.11261
5	0.10000	-1.34891	0.49136	-30.984	0.13220
6	0.12500	-1.26510	0.44166	-30.318	0.15140
7	0.15000	-1.18129	0.39343	-29.496	0.17008
8	0.17500	-1.09748	0.34692	-28.536	0.18813
9	0.20000	-1.01366	0.30234	-27.460	0.20548
10	0.23000	-0.91300	0.25161	-26.054	0.22523
11	0.26000	-0.81251	0.20402	-24.580	0.24369
12	0.29000	-0.71194	0.15957	-23.123	0.26076
13	0.32000	-0.61136	0.11806	-21.740	0.27631
14	0.35000	-0.51079	0.07929	-20.431	0.29029
15	0.38000	-0.41021	0.04307	-19.179	0.30259
16	0.41000	-0.30964	0.00929	-17.957	0.31311
17	0.44000	-0.20906	-0.02213	-16.737	0.32175
18	0.47000	-0.10848	-0.05119	-15.494	0.32843
19	0.50000	-0.00791	-0.07787	-14.208	0.33303
20	0.53000	0.09267	-0.10210	-12.867	0.33546
21	0.56000	0.19324	-0.12379	-11.472	0.33565
22	0.59000	0.29382	-0.14290	-10.037	0.33359
23	0.62000	0.39439	-0.15937	-8.540	0.32931
24	0.65000	0.49497	-0.17305	-6.933	0.32287
25	0.68000	0.59554	-0.18374	-5.168	0.31434
26	0.71000	0.69612	-0.19113	-3.204	0.30378
27	0.74000	0.79669	-0.19489	-1.050	0.29125
28	0.77000	0.89727	-0.19474	1.233	0.27677
29	0.80000	0.99784	-0.19051	3.599	0.26035
30	0.83000	1.09842	-0.18205	6.023	0.24197
31	0.86000	1.19899	-0.16925	8.496	0.22163
32	0.89000	1.29957	-0.15195	11.027	0.19943
33	0.92000	1.40014	-0.12998	13.624	0.17529
34	0.95000	1.50072	-0.10311	16.297	0.14869
35	0.97500	1.58453	-0.07679	18.574	0.12451
36	1.00000	1.66835	-0.04676	20.841	0.09933

------------------ SURFACE COORDINATES ------------------

PT	XS	YS	XP	YP
1	-1.68416	0.69934	-1.68416	0.69934
2	-1.68790	0.67688	-1.66566	0.71228
3	-1.67747	0.66064	-1.64634	0.70985
4	-1.61974	0.61553	-1.58097	0.67725
5	-1.54104	0.55460	-1.49204	0.63338
6	-1.46215	0.49422	-1.40331	0.59023
7	-1.38294	0.43469	-1.31488	0.54803
8	-1.30331	0.37631	-1.22689	0.50701
9	-1.22316	0.31941	-1.13942	0.46745
10	-1.14241	0.26428	-1.05254	0.42956
11	-1.06104	0.21118	-0.96629	0.39351
12	-0.96255	0.15044	-0.86363	0.35278
13	-0.86319	0.09322	-0.76183	0.31483
14	-0.76314	0.03966	-0.66074	0.27947
15	-0.66253	-0.01027	-0.56019	0.24639
16	-0.56145	-0.05673	-0.46012	0.21530
17	-0.45991	-0.09983	-0.36051	0.18597
18	-0.35790	-0.13964	-0.26137	0.15822
19	-0.25539	-0.17619	-0.16273	0.13193
20	-0.15235	-0.20944	-0.06462	0.10705
21	-0.04878	-0.23929	0.03796	0.08355
22	0.05532	-0.26561	0.13002	0.06142
23	0.15986	-0.28827	0.22662	0.04068
24	0.26475	-0.30715	0.32289	0.02134
25	0.36994	-0.32220	0.41884	0.00346
26	0.47548	-0.33331	0.51445	-0.01280
27	0.58139	-0.34027	0.60970	-0.02721
28	0.68763	-0.34279	0.70461	-0.03948
29	0.79403	-0.34049	0.79936	-0.04929
30	0.90025	-0.33310	0.89429	-0.05639
31	1.00601	-0.32043	0.98967	-0.06059
32	1.11111	-0.30237	1.08572	-0.06174
33	1.21537	-0.27884	1.18262	-0.05965
34	1.31864	-0.24982	1.28050	-0.05407
35	1.42079	-0.21516	1.37950	-0.04480
36	1.52158	-0.17447	1.47986	-0.03176
37	1.60436	-0.13580	1.56470	-0.01778
38	1.64101	-0.11721	1.60340	-0.01037
39	1.66592	-0.09179	1.64079	-0.01558
40	1.66835	-0.04676	1.66835	-0.04676

CHORD 3.43453   CAMBER 53.214   STAGGER -12.547

3. PLANE SECTION BLADE COORDINATES

Figure 43 shows the stacked Phase I rotor plane sections. The following tabulation gives the coordinates for these sections. These sections are spaced one half inch apart, beginning at the tip height of 8.5 inches and progressing inward to 2.5 inches. These are the same section locations as given for the baseline rotor in Reference 1. Also included in the tabulation are coordinates for the section meanline, the meanline angle, and the section percent thickness at each point. Plane section chord, camber angle, and stagger angle are also given. These coordinates are intended to represent the blade under hot running conditions and do not include any corrections for blade untwist, meanline deformation, centrifugal growth or thermal growth.
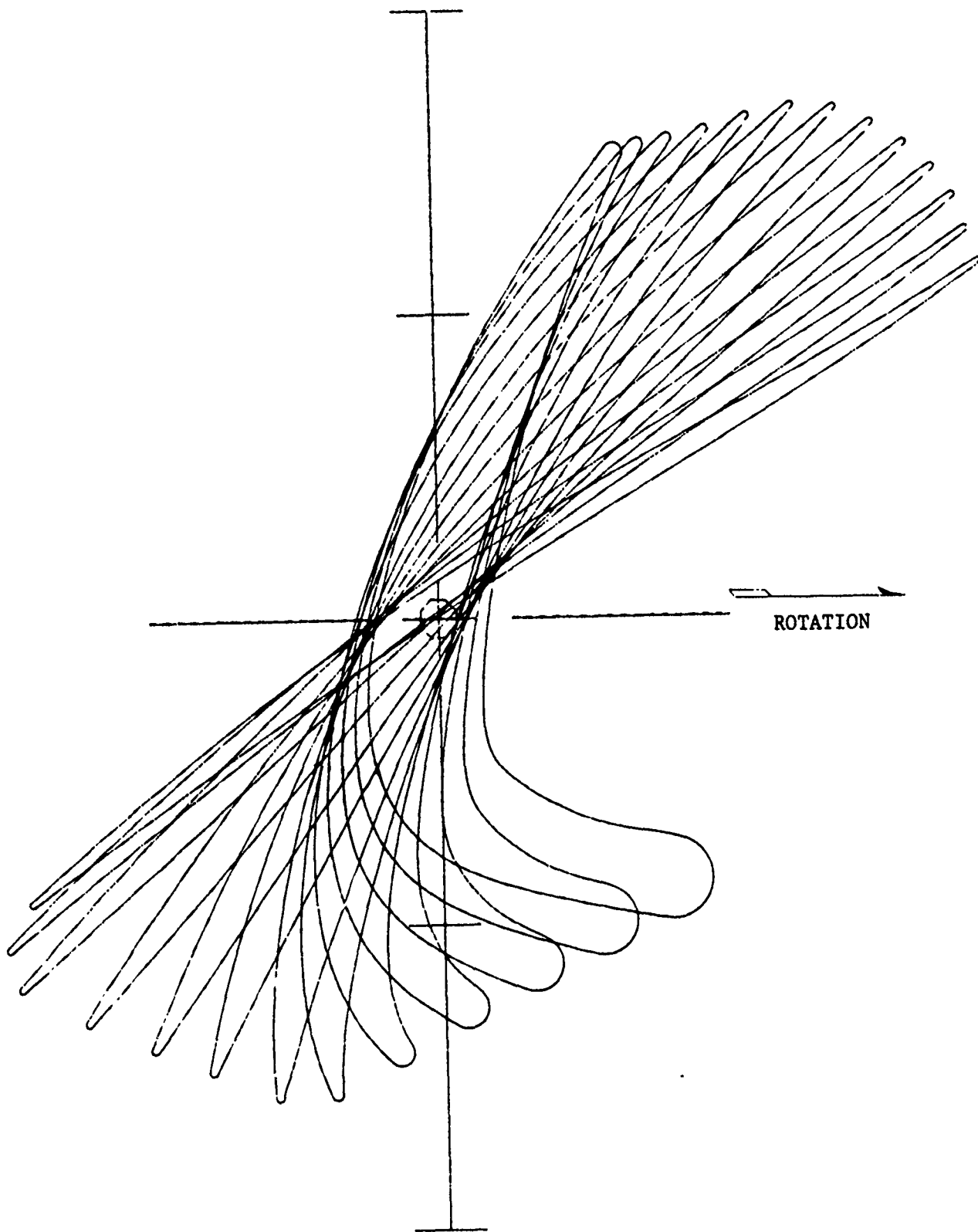
ROTATION

Figure 43 .   Stacked Phase II Rotor Plane Sections

PHASE II ROTOR

STAGE 2. ROTOR   NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU 0.   EIA 8.5000

SECTION NO 1   SECTION AA   RHO 0.

MEANLINE INPUT DATA

PT	ALPHA	ZETA*	THICKNESS	UPSILON
1	-1.09061	57.161	0.01872	1.78982
2	-1.04493	57.678	0.02370	1.71814
3	-0.95244	58.625	0.03383	1.56883
4	0.85845	59.540	0.04406	1.41134
5	0.76279	60.419	0.05419	1.24541
6	0.65574	61.215	0.06492	1.05332
7	-0.53714	61.619	0.07561	0.83487
8	0.41684	61.341	0.08455	0.61288
9	0.29526	60.532	0.09116	0.39384
10	0.17317	59.449	0.09508	0.18238
11	-0.05100	58.351	0.09615	-0.02014
12	0.07083	57.366	0.09436	-0.21408
13	0.19206	56.471	0.08991	-0.40008
14	0.31218	55.658	0.08297	0.57872
15	0.43105	54.925	0.07373	-0.75054
16	0.54865	54.209	0.06235	-0.91583
17	0.66459	53.600	0.04894	-1.07506
18	0.77891	53.408	0.03356	-1.22967
19	0.87281	53.585	0.01918	-1.35679

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA*
1	0.0250	0.00505	-1.09061	1.78982	57.389
2	0.0500	0.00649	-1.04153	1.71276	57.725
3	0.0500	0.00794	-0.99244	1.63414	58.303
4	0.0750	0.00939	-0.94336	1.55385	58.808
5	0.1000	0.01083	-0.89427	1.47202	59.277
6	0.1250	0.01226	-0.84518	1.38867	59.728
7	0.1500	0.01367	-0.79610	1.30383	60.164
8	0.1750	0.01505	-0.74701	1.21751	60.583
9	0.2000	0.01639	-0.69793	1.12977	60.961
10	0.2300	0.01793	-0.63903	1.02279	61.346
11	0.2600	0.01939	-0.58012	0.91441	61.579
12	0.2900	0.02074	-0.52122	0.80538	61.635
13	0.3200	0.02196	-0.46232	0.69646	61.531
14	0.3500	0.02303	-0.40341	0.58836	61.270
15	0.3800	0.02394	-0.34451	0.48169	60.902
16	0.4100	0.02469	-0.28561	0.37680	60.446
17	0.4400	0.02527	-0.22671	0.27397	59.938

63

.ZPC.

STAGE 2. ROTOR NR 20

COORD SYSTEM ORIGIN Z -7.03630 R 0. MU 0. ETA 0.
RHO 8.5000

SECTION NO 1 SECTION AA

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA.
18	0.4700	0.02566	-0.16780	0.17329	59.399
19	0.5000	0.02588	-0.10890	0.07476	58.862
20	0.5300	0.02592	-0.05000	-0.02177	58.356
21	0.5600	0.02578	0.00890	0.11644	57.868
22	0.5900	0.02546	0.06781	-0.20936	57.389
23	0.6200	0.02498	0.12671	-0.30061	56.931
24	0.6500	0.02432	0.18561	-0.39034	56.513
25	0.6800	0.02351	0.24451	-0.47873	56.126
26	0.7100	0.02253	0.30342	-0.56585	55.753
27	0.7400	0.02140	0.36232	-0.65178	55.384
28	0.7700	0.02011	0.42122	-0.73651	55.001
29	0.8000	0.01867	0.48012	-0.82004	54.622
30	0.8300	0.01708	0.53903	-0.90246	54.283
31	0.8600	0.01534	0.59793	-0.98392	53.978
32	0.8900	0.01345	0.65683	-1.06451	53.696
33	0.9200	0.01142	0.71573	-1.14435	53.499
34	0.9500	0.00922	0.77464	-1.22389	53.490
35	0.9750	0.00723	0.82372	-1.29029	53.554
36	1.0000	0.00517	0.87281	-1.35679	53.576

CHORD 3.7089
STAGGER 58.037
CAMBER 3.814

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER		LOWER	
		ALPHA	UPSILON	ALPHA	UPSILON
1	0.00505	-1.09061	1.78982	-1.09061	1.78982
2	0.00505	-1.09489	1.78343	-1.08289	1.79101
3	0.00505	-1.09366	1.77674	-1.07745	1.78715
4	0.00649	-1.05170	1.70634	-1.03135	1.71919
5	0.00794	-1.00497	1.62641	-0.97991	1.64188
6	0.00939	-0.95825	1.54483	-0.92846	1.56287
7	0.01083	-0.91154	1.46175	-0.87700	1.48228
8	0.01226	-0.86483	1.37721	-0.82554	1.40014
9	0.01367	-0.81809	1.29122	-0.77411	1.31644
10	0.01505	-0.77132	1.20380	-0.72270	1.23122
11	0.01639	-0.72450	1.11501	-0.67135	1.14452
12	0.01793	-0.66821	1.00684	-0.60984	1.03874
13	0.01939	-0.61175	0.89729	-0.54850	0.93153
14	0.02074	-0.55506	0.78710	-0.48738	0.82365

64

PHASE II ROTOR

STAGE 2 ROTOR NR 20

COORD SYSTEM ORIGIN Z -7.03630 R O. MU O. ETA O.

SECTION NO 1 SECTION AA RHO 8.5000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER ALPHA	UPPER UPSILON	LOWER ALPHA	LOWER UPSILON
15	0.02196	-0.49811	0.67705	-0.42652	0.71586
16	0.02303	-0.44086	0.56783	-0.36597	0.60889
17	0.02394	-0.38331	0.46010	-0.30572	0.50328
18	0.02469	-0.32544	0.35422	-0.24578	0.39939
19	0.02527	-0.26726	0.25050	-0.18616	0.29744
20	0.02566	-0.20877	0.14906	-0.12684	0.19752
21	0.02588	-0.14999	0.04994	-0.06782	0.09958
22	0.02592	-0.09092	-0.04699	-0.00907	0.00345
23	0.02578	-0.03158	-0.14187	0.04939	-0.09102
24	0.02546	0.02803	-0.23481	0.10758	-0.18391
25	0.02498	0.08789	-0.32588	0.16552	-0.27534
26	0.02432	0.14799	-0.41523	0.22323	-0.36546
27	0.02351	0.20832	-0.50303	0.28071	-0.45443
28	0.02253	0.26888	-0.58937	0.33795	-0.54234
29	0.02140	0.32966	-0.67432	0.39497	-0.62924
30	0.02011	0.39067	-0.75790	0.45177	-0.71512
31	0.01867	0.45189	-0.84009	0.50836	-0.79999
32	0.01708	0.51330	-0.92096	0.56475	-0.88397
33	0.01534	0.57492	-1.00065	0.62094	-0.96719
34	0.01345	0.63672	-1.07928	0.67694	-1.04973
35	0.01142	0.69871	-1.15695	0.73276	-1.13175
36	0.00922	0.76090	-1.23406	0.78837	-1.21372
37	0.00723	0.81293	-1.29825	0.83451	-1.28232
38	0.00517	0.85905	-1.35504	0.87520	-1.34313
39	0.00517	0.86501	-1.35858	0.87682	-1.34985
40	0.00517	0.87281	-1.35679	0.87281	-1.35679

LE RAD 0.00964 CENTER AT ALPHA -1.08540 UPSILON 1.78171
TE RAD 0.01005 CENTER AT ALPHA 0.86684 UPSILON -1.34870

PHASE II ROTOR

STAGE 2. ROTOR   MU 0.   NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0.   ETA 0.

SECTION NO 1   SECTION AA   RHO 8.5000

CHORD 3.7089   STAGGER 58.037   CAMBER 3.814

AREA 0.256045   SURFACE ARC LENGTH 7.44936

	ALPHA	UPSILON
SECTION C.G.	-0.11669	0.13422
STREAMSURFACE SECTION C.G.	-0.11484	0.12907
BLADE AXIS	-0.11484	0.12907
STACKING AXIS (RADIAL)	-0.00010	0.

'ZPC'

PHASE II ROTOR

STAGE 2. ROTOR

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU 0.   NB 20   ETA 0.

SECTION NO 2   SECTION BB   RHO 8.0000

MEANLINE INPUT DATA

PT	ALPHA	ZETA*	THICKNESS	UPSILON
1	-1.19539	55.551	0.01960	1.75040
2	-1.14383	55.976	0.02492	1.67461
3	-1.03927	56.841	0.03576	1.51729
4	-0.93303	57.762	0.04679	1.35171
5	-0.82496	58.577	0.05777	1.17746
6	-0.70430	59.014	0.06940	0.97764
7	-0.57050	58.862	0.08082	0.75498
8	-0.43516	58.149	0.09027	0.53340
9	0.29854	57.110	0.09720	0.31762
10	-0.16127	56.000	0.10129	0.10974
11	0.02394	55.079	0.10238	-0.09020
12	0.11314	54.249	0.10045	-0.28332
13	0.24954	53.549	0.09564	-0.47036
14	0.38507	52.874	0.08814	-0.65139
15	0.51926	52.202	0.07814	-0.82624
16	0.65171	51.571	0.06581	-0.99483
17	0.78228	50.916	0.05137	-1.15717
18	0.91070	50.085	0.03505	-1.31282
19	1.01615	49.332	0.02015	-1.43692

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA*
1	0.0250	0.00505	-1.19539	1.75040	55.551
2	0.0500	0.00652	-1.14011	1.66908	56.001
3	0.0500	0.00800	-1.08482	1.58646	56.432
4	0.0750	0.00948	-1.02953	1.50237	56.927
5	0.1000	0.01096	-0.97424	1.41665	57.422
6	0.1250	0.01244	0.91895	1.32933	57.887
7	0.1500	0.01389	-0.86366	1.24049	58.313
8	0.1750	0.01532	-0.80837	1.15024	58.693
9	0.2000	0.01671	-0.75309	1.05884	58.942
10	0.2300	0.01830	-0.68674	0.94838	59.042
11	0.2600	0.01979	-0.62039	0.83783	58.996
12	0.2900	0.02116	-0.55405	0.72775	58.828
13	0.3200	0.02240	-0.48770	0.61868	58.525
14	0.3500	0.02348	-0.42135	0.51120	58.079
15	0.3800	0.02440	-0.35501	0.40574	57.568
16	0.4100	0.02516	-0.28866	0.30238	57.033
17	0.4400	0.02573	-0.22232	0.20112	56.498

PHASE II ROTOR

STAGE 2. ROTOR   NR 20   ETA 0.

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU 0.   RHO 8.0000

SECTION NO 2   SECTION BB

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA*
18	0.4700	0.02613	-0.15597	0.10188	55.977
19	0.5000	0.02635	-0.08962	0.00451	55.487
20	0.5300	0.02639	-0.02328	-0.09116	55.038
21	0.5600	0.02624	0.04307	-0.18532	54.631
22	0.5900	0.02592	0.10942	-0.27815	54.268
23	0.6200	0.02541	0.17576	-0.36980	53.926
24	0.6500	0.02474	0.24211	-0.46029	53.575
25	0.6800	0.02390	0.30845	-0.54962	53.223
26	0.7100	0.02289	0.37480	-0.63782	52.881
27	0.7400	0.02172	0.44115	-0.72496	52.549
28	0.7700	0.02039	0.50749	-0.81107	52.224
29	0.8000	0.01891	0.57384	-0.89619	51.902
30	0.8300	0.01727	0.64019	-0.98031	51.574
31	0.8600	0.01547	0.70653	-1.06345	51.241
32	0.8900	0.01353	0.77288	-1.14560	50.910
33	0.9200	0.01145	0.83922	-1.22675	50.540
34	0.9500	0.00921	0.90557	-1.30670	50.061
35	0.9750	0.00723	0.96086	-1.37223	49.646
36	1.0000	0.00519	1.01615	-1.43692	49.332

CHORD 3.8794   STAGGER 55.245   CAMBER 6.219

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER		LOWER	
		ALPHA	UPSILON	ALPHA	UPSILON
1	0.00505	-1.19539	1.75040	-1.19539	1.75040
2	0.00505	-1.19967	1.74357	-1.18736	1.75189
3	0.00505	-1.19819	1.73662	-1.18154	1.74801
4	0.00652	-1.15059	1.66201	-1.12962	1.67616
5	0.00800	-1.09774	1.57788	-1.07189	1.59503
6	0.00948	-1.04494	1.49233	-1.01412	1.51240
7	0.01096	-0.99216	1.40520	-0.95632	1.42810
8	0.01244	-0.93938	1.31651	-0.89852	1.34216
9	0.01389	-0.88659	1.22634	-0.84074	1.25465
10	0.01532	-0.83376	1.13480	-0.78299	1.16568
11	0.01671	-0.78085	1.04212	-0.72532	1.07556
12	0.01830	-0.71718	0.93012	-0.65630	0.96664
13	0.01979	-0.65330	0.81806	-0.58749	0.85761
14	0.02116	-0.58917	0.70651	-0.51893	0.74900

'7PC'

STAGE   2.   ROTOR   NB   20

COORD SYSTEM ORIGIN Z -7.C3630 R O.   MU O.   ETA O.

SECTION NO 2   SECTION BB   RHO 8.0XX0

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	1/C	UPPER		LOWER	
		ALPHA	UPSILON	ALPHA	UPSILON
15	0.02240	-0.52475	0.59600	-0.45065	0.64137
16	0.02348	-0.46001	0.48712	-0.38269	0.53528
17	0.02440	-0.39496	0.38035	-0.31506	0.43112
18	0.02516	-0.32960	0.27583	-0.24772	0.32893
19	0.02573	-0.26394	0.17357	-0.18069	0.22868
20	0.02613	-0.19799	0.07352	-0.11395	0.13024
21	0.02635	-0.13174	-0.02445	-0.04750	0.03348
22	0.02639	-0.06523	-0.12049	0.01867	-0.06182
23	0.02624	0.00156	-0.21478	0.08458	-0.15585
24	0.02592	0.06861	-0.30751	0.15022	-0.24879
25	0.02541	0.13592	-0.39882	0.21560	-0.34077
26	0.02474	0.20350	-0.48878	0.28072	-0.43179
27	0.02390	0.27133	-0.57737	0.34558	-0.52186
28	0.02289	0.33940	-0.66462	0.41020	-0.61103
29	0.02172	0.40770	-0.75058	0.47460	-0.69934
30	0.02039	0.47623	-0.83530	0.53876	-0.78684
31	0.01891	0.54498	-0.91881	0.60270	-0.87356
32	0.01727	0.61395	-1.00113	C.56642	-0.95950
33	0.01547	0.68313	-1.08223	0.72?93	-1.04466
34	0.01353	0.75251	-1.16214	0.79325	-1.12905
35	0.01145	0.82208	-1.24087	0.85637	-1.21264
36	0.00921	0.89187	-1.31817	0.91927	-1.29523
37	0.00723	0.95017	-1.38132	0.97155	-1.36314
38	0.00519	1.00158	-1.43616	1.01759	-1.42241
39	0.00519	1.00805	-1.43940	1.01982	-1.42940
40	0.00519	1.01615	-1.43692	1.01615	-1.43692

LE RAD 0.01009   CENTER AT ALPHA -1.18970   UPSILON 1.74207
TE RAD 0.01056   CENTER AT ALPHA   1.00927   UPSILON -1.42891

PHASE II ROTOR

·ZFC·

STAGE 2 ROTOR NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0. MU 0. ETA 0

SECTION NO 2 SECTION BB RHO 8.0000

CHORD STAGGER CAMBER
7.8794 55.245 6.219

AREA 0.283628 SURFACE ARC LENGTH 7.79324

	ALPHA	UPSILON
SECTION C.G.	-0.09951	0.06421
SURFACE SECTION C.G.	-0.09706	0.06025
BLADE AXIS	-0.09706	0.06025
STACKING AXIS (RADIAL)	-0.00010	0.

70

PHASE II ROTOR

STAGE 2. ROTOR NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0. MU 0. ETA 0.

SECTION NO 3   SECTION CC   RHO 7.5000

MEANLINE INPUT DATA

PT	ALPHA	ZETA.	THICKNESS	UPSILON
1	1.29938	53.992	0.02038	1.71046
2	-1.24256	54.533	0.02671	1.63139
3	1.12753	55.457	0.03986	1.46696
4	-1.01070	56.080	0.05339	1.29521
5	0.89210	56.348	0.06688	1.11791
6	-0.75977	56.250	0.08111	0.91953
7	0.61347	55.670	0.09510	0.70267
8	-0.46544	54.460	0.10664	0.49045
9	-0.31614	52.941	0.11508	0.28729
10	-0.16609	51.611	0.12012	0.09354
11	-0.01568	50.540	0.12162	-0.09254
12	0.13467	49.698	0.11951	-0.27239
13	0.28475	49.063	0.11399	-0.44735
14	0.43414	48.583	0.10519	-0.61823
15	0.58274	48.208	0.09325	-0.78571
16	0.73022	47.884	0.07836	-0.95008
17	0.87633	47.514	0.06067	-1.11110
18	1.02096	46.955	0.04046	-1.26813
19	1.14019	46.316	0.02182	-1.39525

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA.
1	0.	0.00516	1.29938	1.71046	53.992
2	0.0250	0.00688	-1.23839	1.62553	54.606
3	0.0500	0.00864	-1.17740	1.53889	55.092
4	0.0750	0.01042	-1.11641	1.45079	55.512
5	0.1000	0.01221	-1.05542	1.36141	55.855
6	0.1250	0.01399	-0.99443	1.27101	56.117
7	0.1500	0.01576	-0.93344	1.17989	56.273
8	0.1750	0.01749	-0.87245	1.08843	56.319
9	0.2000	0.01917	-0.81146	0.99694	56.294
10	0.2300	0.021C3	-0.73828	0.88742	56.183
11	0.2600	0.02290	-0.66509	0.77863	55.931
12	0.2900	0.02455	-0.59190	0.67119	55.515
13	0.3200	0.02604	-0.51872	0.56571	54.951
14	0.3500	0.02734	-0.44553	0.46270	54.240
15	0.3800	0.02843	-0.37234	0.36246	53.495
16	0.4100	0.02933	-0.29916	0.26487	52.767
17	0.4400	0.03001	-0.22597	0.16975	52.093

PHASE II ROTOR

STAGE 2. ROTOR NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0. MU 0. ETA 0.

SECTION NO 3 SECTION CC RHO 7.5000

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA
18	0.4700	0.03049	-0.15278	0.07678	51.497
19	0.5000	0.03075	-0.07960	-0.01433	50.962
20	0.5300	0.03079	-0.00641	-0.10380	50.481
21	0.5600	0.03061	0.06678	-0.19184	50.053
22	0.5900	0.03023	0.13996	-0.27863	49.679
23	0.6200	0.02964	0.21315	-0.36436	49.354
24	0.6500	0.02884	0.28634	-0.44918	49.077
25	0.6800	0.02785	0.35953	-0.53324	48.834
26	0.7100	0.02666	0.43271	-0.61661	48.614
27	0.7400	0.02527	0.50590	-0.69937	48.420
28	0.7700	0.02370	0.57909	-0.78162	48.254
29	0.8000	0.02193	0.65227	-0.86341	48.106
30	0.8300	0.01997	0.72546	-0.94480	47.964
31	0.8600	0.01783	0.79865	-1.02576	47.802
32	0.8900	0.01551	0.87183	-1.10619	47.585
33	0.9200	0.01302	0.94502	-1.18596	47.355
34	0.9500	0.01035	1.01821	-1.26516	47.166
35	0.9750	0.00797	1.07920	-1.33068	46.893
36	1.0000	0.00552	1.14019	-1.39525	46.316

CHORD 3.9493 STAGGER 51.850 CAMBER 7.676

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER ALPHA	UPSILON	LOWER ALPHA	UPSILON
1	0.00516	-1.29938	1.71046	-1.29938	1.71046
2	0.00516	-1.30364	1.70325	-1.29104	1.71224
3	0.00516	-1.30192	1.69605	-1.28489	1.70838
4	0.00688	-1.24947	1.61766	-1.22731	1.63340
5	0.00864	-1.15139	1.52913	-1.16341	1.54866
6	0.01042	-1.13337	1.43914	-1.09945	1.46244
7	0.01221	-1.07537	1.34788	-1.03547	1.37494
8	0.01399	-1.01737	1.25561	-0.97149	1.28642
9	0.01576	-0.95932	1.16262	-0.90756	1.19717
10	0.01749	-0.90119	1.06928	-0.84372	1.10758
11	0.01917	-0.84295	0.97594	-0.77998	1.01794
12	0.02109	-0.77288	0.86424	-0.70368	0.91060
13	0.02290	-0.70254	0.75330	-0.62764	0.80396
14	0.02455	-0.63187	0.64374	-0.55194	0.69864

'ZPC'

PHASE II ROTOR

STAGE 2. ROTOR NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0. MU 0. ETA 0.

SECTION NO 3 SECTION CC RHO 7.5000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER		LOWER	
		ALPHA	UPSILON	ALPHA	UPSILON
15	0.02604	-0.56081	0.53618	-0.47663	0.59524
16	0.02734	-0.48933	0.43116	-0.40173	0.49425
17	0.02843	-0.41747	0.32905	-0.32721	0.39586
18	0.02933	-0.34526	0.22983	-0.25305	0.29991
19	0.03001	-0.27273	0.13334	-0.17921	0.20616
20	0.03049	-0.19989	0.03931	-0.10567	0.11426
21	0.03075	-0.12675	-0.05256	-0.03244	0.02391
22	0.03079	-0.05331	0.14248	0.04049	-0.06511
23	0.03061	0.02043	-0.23065	0.11312	-0.15302
24	0.03023	0.09446	-0.31725	0.18547	-0.24001
25	0.02964	0.16875	-0.40248	0.25755	-0.32624
26	0.02884	0.24330	-0.48649	0.32937	-0.41187
27	0.02785	0.31813	-0.56944	0.40093	-0.49704
28	0.02666	0.39322	-0.65141	0.47221	-0.58180
29	0.02527	0.46857	-0.73250	0.54323	-0.66625
30	0.02370	0.54417	-0.81277	0.61400	-0.75046
31	0.02193	0.62004	-0.89233	0.68451	-0.83450
32	0.01997	0.69617	-0.97121	0.75476	-0.91839
33	0.01783	0.77256	-1.04941	0.82473	-1.00211
34	0.01551	0.84922	-1.12685	0.89445	-1.08553
35	0.01302	0.92611	-1.20338	0.96394	-1.16854
36	0.01035	1.00322	-1.27905	1.03319	-1.25126
37	0.00797	1.06770	-1.34144	1.09069	-1.31992
38	0.00552	1.12432	-1.39528	1.14032	-1.37862
39	0.00552	1.13153	-1.39840	1.14377	-1.38640
40	0.00552	1.14019	-1.39525	1.14019	-1.39525

LE RAD 0.01052 CENTER AT ALPHA -1.29320 UPSILON 1.70194
TE RAD 0.01155 CENTER AT ALPHA 1.13223 UPSILON -1.38687

73

PHASE II ROTOR

•ZPC•

STAGE 2. ROTOR NR 20

COORD SYSTEM ORIGIN Z -7.03630 R 0 MU 0. RHO 7.5000 ETA 0.

SECTION NO 3 SECTION CC

CHORD 2.9493

STAGGER 51.850

CAMBER 7.676

AREA 0.337014 SURFACE ARC LENGTH 7.93903

	ALPHA	UPSILON
SECTION C.G	-0.08937	0.04631
STREAMSURFACE SECTION C.G	-0.10151	0.05711
BLADE AXIS	-0.10151	0.05711
STACKING AXIS (RADIAL)	-0.00010	0

74

STAGE 2 ROTOR

COORD SYSTEM ORIGIN Z -7.03630 P 0.   MU 0.   NB 20   ETA 0.

SECTION NO 4   SECTION DD   RHO 7.0000

MEANLINE INPUT DATA

PT	ALPHA	ZETA*	THICKNESS	UPSILON
1	-1.38939	52.546	0.02064	1.64284
2	-1.32788	52.904	0.02884	1.56207
3	-1.20360	53.450	0.04585	1.39603
4	-1.07763	53.634	0.06331	1.22530
5	-0.95014	53.445	0.08067	1.05245
6	0.80810	52.946	0.09895	0.86233
7	-0.65139	52.081	0.11701	0.65733
8	-0.49302	50.303	0.13204	0.45987
9	-0.33338	48.148	0.14324	0.27474
10	-0.17285	46.344	0.15019	0.10130
11	-0.01172	44.887	0.15269	-0.06327
12	0.14984	43.656	0.15060	-0.22068
13	0.31144	42.579	0.14405	-0.37198
14	0.47298	41.666	0.13323	-0.51802
15	0.63431	40.943	0.11826	-0.65982
16	0.79530	40.392	0.09918	-0.79816
17	0.95590	39.965	0.07601	-0.93386
18	1.11622	39.577	0.04864	-1.06721
19	1.24928	39.254	0.02749	-1.17683

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA*
1	0.	0.00535	-1.38939	1.64284	52.546
2	0.0250	0.00762	-1.32342	1.55617	52.907
3	0.0500	0.00995	-1.25745	1.46839	53.231
4	0.0750	0.01231	-1.19149	1.37969	53.477
5	0.1000	0.01468	-1.12552	1.29035	53.620
6	0.1250	0.01704	-1.05955	1.20073	53.647
7	0.1500	0.01938	-0.99359	1.11121	53.568
8	0.1750	0.02166	-0.92762	1.02210	53.392
9	0.2000	0.02388	-0.86165	0.93364	53.182
10	0.2300	0.02643	-0.78249	0.82841	52.903
11	0.2600	0.02883	-0.70333	0.72448	52.469
12	0.2900	0.03103	-0.62417	0.62255	51.829
13	0.3200	0.03302	-0.54501	0.52330	50.984
14	0.3500	0.03476	-0.46585	0.42736	49.933
15	0.3800	0.03624	-0.38669	0.33502	48.859
16	0.4100	0.03746	-0.30753	0.24604	47.833
17	0.4400	0.03840	-0.22837	0.16006	46.912

STAGE 2. ROTOR   NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU 0.   ETA 0.

SECTION NO 4   SECTION DD   RHO 7.0000

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA•
18	0.4700	0.03906	-0.14921	0.07662	46.119
19	0.5000	0.03944	-0.07005	-0.00465	45.395
20	0.5300	0.03954	0.00911	-0.08396	44.718
21	0.5600	0.03934	0.08827	-0.16148	44.097
22	0.5900	0.03887	0.16743	-0.23743	43.535
23	0.6200	0.03812	0.24659	-0.31194	43.005
24	0.6500	0.03710	0.32575	-0.38511	42.496
25	0.6800	0.03581	0.40491	-0.45704	42.032
26	0.7100	0.03427	0.48407	-0.52788	41.629
27	0.7400	0.03246	0.56323	-0.59778	41.266
28	0.7700	0.03040	0.64239	-0.66683	40.931
29	0.8000	0.02808	0.72155	-0.73511	40.642
30	0.8300	0.02550	0.80071	-0.80277	40.409
31	0.8500	0.02265	0.87987	-0.86990	40.186
32	0.8900	0.01955	0.95903	-0.93648	39.939
33	0.9200	0.01620	1.03819	-1.00250	39.732
34	0.9500	0.01254	1.11735	-1.06814	39.622
35	0.9750	0.00924	1.18332	-1.12267	39.504
36	1.0000	0.00582	1.24928	-1.17683	39.254

CHORD   STAGGER   CAMBER
? RG18   46.899   13.292

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER ALPHA	UPPER UPSILON	LOWER ALPHA	LOWER UPSILON
1	0.00535	-1.38939	1.64284	-1.38939	1.64284
2	0.00535	-1.39354	1.63538	-1.38099	1.64489
3	0.00535	-1.39164	1.62813	-1.37460	1.64118
4	0.00762	-1.33516	1.54729	-1.31168	1.56505
5	0.00995	-1.27284	1.45689	-1.24207	1.47989
6	0.01231	-1.21058	1.36555	-1.17239	1.39383
7	0.01468	-1.14834	1.27354	-1.10270	1.30716
8	0.01704	-1.08605	1.18123	-1.03305	1.22024
9	0.01938	-1.02369	1.08899	-0.96348	1.13343
10	0.02166	-0.96120	0.99715	-0.89404	1.04705
11	0.02388	-0.89857	0.90600	-0.82473	0.96127
12	0.02643	-0.82320	0.79762	-0.74178	0.85919
13	0.02883	-0.74747	0.69057	-0.65919	0.75839
14	0.03103	-0.67128	0.58552	-0.57706	0.65958

STAGE 2. ROTOR   NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU 0.   ETA 0.

SECTION NO 4   SECTION DD   RHO 7.0000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER		LOWER	
		ALPHA	UPSILON	ALPHA	UPSILON
15	0.03302	-0.59455	0.48316	-0.49547	0.56343
16	0.03476	-0.51722	0.38415	-0.41448	0.47056
17	0.03624	-0.43939	0.28897	-0.33399	0.38106
18	0.03746	-0.36114	0.19748	-0.25392	0.29459
19	0.03840	-0.28252	0.10941	-0.17422	0.21071
20	0.03906	-0.20357	0.02434	-0.09485	0.12890
21	0.03944	-0.12427	-0.05813	-0.01583	0.04883
22	0.03954	-0.04461	-0.13820	0.06282	-0.02971
23	0.03934	0.03541	-0.21604	0.14113	-0.10693
24	0.03887	0.11574	-0.29183	0.21912	-0.18302
25	0.03812	0.19639	-0.36576	0.29679	-0.25812
26	0.03710	0.27736	-0.43793	0.37414	-0.33230
27	0.03581	0.35861	-0.50840	0.45121	-0.40568
28	0.03427	0.44011	-0.57734	0.52803	-0.47842
29	0.03246	0.52189	-0.64490	0.60457	-0.55066
30	0.03040	0.60393	-0.71118	0.68085	-0.62748
31	0.02808	0.68623	-0.77626	0.75687	-0.69397
32	0.02550	0.76880	-0.84026	0.83263	-0.76528
33	0.02265	0.85165	-0.90332	0.90810	-0.83649
34	0.01955	0.93479	-0.96543	0.98327	-0.90753
35	0.01620	1.01320	-1.02655	1.05818	-0.97844
36	0.01254	1.10191	-1.08679	1.13279	-1.04949
37	0.00924	1.17195	-1.13644	1.19467	-1.10889
38	0.00582	1.23293	-1.17911	1.24829	-1.16036
39	0.00582	1.24081	-1.18126	1.25195	-1.16771
40	0.00582	1.24928	-1.17683	1.24928	-1.17683

LE RAD 0.01074   CENTER AT ALPHA -1.38286   UPSILON 1.63431

TE RAD 0.01216   CENTER AT ALPHA   1.23987   UPSILON -1.16914

ZPC

PHASE II ROTOR

STAGE 2. ROTOR   NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU 0.   ETA 0.

SECTION NO 4   SECTION DD   RHO 7.0000

CHORD   STAGGER   CAMBER
3.8618   46.899   13.292

AREA 0.406486   SURFACE ARC LENGTH 7.78701

	ALPHA	UPSILON
SECTION C.G.	-0.08627	0.07392
STREAMSURFACE SECTION C.G.	-0.11097	0.08868
BLADE AXIS	-0.11097	0.08868
STACKING AXIS (RADIAL)	0.00010	0.

PHASE II ROTOR

.7PC.

STAGE 2. ROTOR   NR 20

COORD SYSTEM ORIGIN Z -7.03630 R O.   MU O.   ETA O.

SECTION NO 5   SECTION EE   RHO 6.5000

MEANLINE INPUT DATA

PT	ALPHA	ZETA*	THICKNESS	UPSILON
1	-1.46628	51.183	0.02050	1.55327
2	-1.40102	51.385	0.03163	1.47176
3	-1.26926	51.598	0.05480	1.30597
4	-1.13602	51.478	0.07858	1.13794
5	-1.00121	51.027	0.10213	0.96985
6	-0.85125	50.125	0.12672	0.78717
7	-0.68590	48.404	0.15068	0.59466
8	-0.51903	45.882	0.17039	0.41447
9	-0.35082	43.287	0.18508	0.24897
10	-0.18163	41.228	0.19444	0.09558
11	-0.01166	39.401	0.19813	-0.04843
12	0.15881	37.640	0.19593	-0.18392
13	0.32987	36.081	0.18798	-0.31184
14	0.50131	34.734	0.17434	-0.43336
15	0.67311	33.541	0.15498	-0.54945
16	0.84521	32.512	0.12973	-0.66093
17	1.01769	31.665	0.09830	-0.76857
18	1.19064	30.979	0.06012	-0.87319
19	1.33512	30.457	0.02261	-0.95861

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AI	T/C	ALPHA	UPSILON	ZETA*
1	0.0250	0.00545	-1.46628	1.55327	51.183
2	0.0500	0.00862	-1.39624	1.46578	51.428
3	0.0750	0.01188	-1.32621	1.37776	51.546
4	0.1000	0.01519	-1.25617	1.28944	51.618
5	0.1250	0.01851	-1.18614	1.20104	51.588
6	0.1500	0.02182	-1.11610	1.11293	51.428
7	0.1750	0.02509	-1.04607	1.02546	51.196
8	0.2000	0.02828	-0.97603	0.93880	50.906
9	0.2300	0.03136	-0.90600	0.85317	50.514
10	0.2600	0.03488	-0.82196	0.75225	49.882
11	0.2900	0.03816	-0.73791	0.65392	49.037
12	0.3200	0.04115	-0.65387	0.55887	47.960
13	0.3500	0.04383	-0.56983	0.46763	46.711
14	0.3800	0.04617	-0.48579	0.38053	45.316
15	0.4100	0.04816	-0.40175	0.29752	43.997
16	0.4400	0.04979	-0.31770	0.21804	42.826
17		0.05107	-0.23366	0.14159	41.776

PHASE II ROTOR

STAGE 2. ROTOR   NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU 0.   ETA 0.

SECTION NO 5   SECTION EE   RHO 6.5000

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA•
18	0.4700	0.05198	-0.14962	0.06775	40.841
19	0.5000	0.05251	-0.06558	-0.00375	39.937
20	0.5300	0.05267	0.01846	-0.07301	39.044
21	0.5600	0.05244	0.10251	-0.14011	38.171
22	0.5900	0.05183	0.18655	-0.20517	38.171
23	0.6200	0.05086	0.27059	-0.26833	37.324
24	0.6500	0.04953	0.35463	-0.32977	36.535
25	0.6800	0.04783	0.43867	-0.38967	35.816
26	0.7100	0.04576	0.52272	-0.44811	35.140
27	0.7400	0.04336	0.60676	-0.50523	34.501
28	0.7700	0.04057	0.69080	-0.56111	33.903
29	0.8000	0.03742	0.77484	-0.61588	33.350
30	0.8300	0.03388	0.85888	-0.66960	32.833
31	0.8600	0.02995	0.94293	-0.72236	32.347
32	0.8900	0.02563	1.02697	-0.77426	31.902
33	0.9200	0.02091	1.11101	-0.82540	31.505
34	0.9500	0.01569	1.19505	-0.87582	31.138
35	0.9750	0.01095	1.26509	-0.91735	30.789
36	1.0000	0.00601	1.33512	-0.95861	30.567
					30.457

CHORD 3.7626   STAGGER 41.881   CAMBER 20.727

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER ALPHA	UPPER UPSILON	LOWER ALPHA	LOWER UPSILON
1	0.00545	-1.46628	1.55327	-1.46628	1.55327
2	0.00545	-1.47028	1.54570	-1.45797	1.55554
3	0.00545	-1.46828	1.53854	-1.45146	1.55205
4	0.00862	-1.40893	1.45566	-1.38356	1.47589
5	0.01188	-1.34371	1.36387	-1.30871	1.39166
6	0.01519	-1.27857	1.27170	-1.23378	1.30718
7	0.01851	-1.21343	1.17940	-1.15885	1.22267
8	0.02182	-1.14820	1.08734	-1.08401	1.13853
9	0.02509	-1.08285	0.99589	-1.00929	1.05504
10	0.02828	-1.01732	0.90525	-0.93474	0.97235
11	0.03136	-0.95153	0.81566	-0.86046	0.89069
12	0.03488	-0.87214	0.70997	-0.77178	0.79454
13	0.03816	-0.79212	0.60686	-0.68371	0.70098
14	0.04115	-0.71137	0.50703	-0.59638	0.61071

PHASE II ROTOR

STAGE 2. ROTOR NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0. MU 0. ETA 0.

SECTION NO 5 SECTION EE RHO 6.5000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER ALPHA	UPPER UPSILON	LOWER ALPHA	LOWER UPSILON
15	0.04383	-0.62985	0.41109	-0.50981	0.52416
16	0.04617	-0.54754	0.31945	-0.42403	0.44161
17	0.04816	-0.46468	0.23234	-0.33882	0.36269
18	0.04979	-0.38138	0.14933	-0.25403	0.28674
19	0.05107	-0.29767	0.06993	-0.16965	0.21324
20	0.05198	-0.21357	-0.00623	-0.08567	0.14173
21	0.05251	-0.12900	-0.07950	-0.00216	0.07200
22	0.05267	-0.04395	-0.14996	0.08088	0.00395
23	0.05244	0.04154	-0.21767	0.16347	-0.06256
24	0.05183	0.12742	-0.28272	0.24567	-0.12763
25	0.05086	0.21362	-0.34522	0.32756	-0.19144
26	0.04953	0.30010	-0.40533	0.40916	-0.25421
27	0.04783	0.38688	-0.46325	0.49047	-0.31608
28	0.04578	0.47394	-0.51909	0.57149	-0.37714
29	0.04336	0.56126	-0.57293	0.65226	-0.43752
30	0.04057	0.64884	-0.62487	0.73276	-0.49735
31	0.03742	0.73668	-0.67502	0.81301	-0.55673
32	0.03388	0.82478	-0.72344	0.89298	-0.61575
33	0.02995	0.91315	-0.77019	0.97270	-0.67453
34	0.02563	1.00177	-0.81537	1.05216	-0.73315
35	0.02091	1.09067	-0.85906	1.13135	-0.79174
36	0.01569	1.17994	-0.90118	1.21016	-0.85047
37	0.01095	1.25461	-0.93509	1.27556	-0.89962
38	0.00601	1.31905	-0.96378	1.33183	-0.94206
39	0.00601	1.32730	-0.96448	1.33646	-0.94899
40	0.00601	1.33512	-0.95861	1.33512	-0.95861

LE RAD 0.01081 CENTER AT ALPHA -1.45951 UPSILON
TF RAD 0.01268 CENTER AT ALPHA 1.32419 UPSILON

81

‧ZPC‧

PHASE II ROTOR

STAGE 2 ROTOR NB 20

COORD SYSTEM ORIGIN Z -7.03630 R O MU O. ETA O.

SECTION NO 5 SECTION EE RHO 6.5000

CHORD STAGGER CAMBER
3.7626 41.881 20.727

AREA 0.508640 SURFACE ARC LENGTH 7.62824

	ALPHA	UPSILON
SECTION C.G.	-0.08790	0.08773
STREAMSURFACE SECTION C.G.	-0.12000	0.09731
BLADE AXIS	-0.12000	0.09731
STACKING AXIS (RADIAL)	-0.00010	0.

PHASE II ROTOR

.ZPC.

STAGE 2. ROTOR

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU 0.   NB 20   ETA 0.

SECTION NO 6   SECTION FF   RHO 6.0000

MEANLINE INPUT DATA

PI	ALPHA	ZETA.	THICKNESS	UPSILON
1	-1.53198	49.999	0.01964	1.44860
2	-1.46348	50.044	0.03399	1.36691
3	-1.32524	50.007	0.06328	1.20210
4	-1.18548	49.700	0.09269	1.03633
5	-1.04414	48.905	0.12123	0.87184
6	-0.88725	47.071	0.15041	0.69693
7	0.71439	44.081	0.17822	0.52005
8	-0.53996	41.091	0.20093	0.35978
9	0.36446	38.553	0.21804	0.21323
10	0.18792	36.326	0.22912	0.07776
11	0.01050	34.187	0.23370	-0.04818
12	0.16773	32.085	0.23146	-0.16501
13	0.34668	30.091	0.22245	-0.27343
14	0.52636	28.157	0.20669	-0.37422
15	0.70688	26.266	0.18401	-0.46777
16	0.88821	24.496	0.15401	-0.55458
17	1.07049	22.822	0.11607	-0.63527
18	1.25400	21.157	0.06924	-0.71010
19	1.40796	19.665	0.02250	-0.76778

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA.
1	0.0	0.00533	-1.53198	1.44860	49.999
2	0.0250	0.00952	-1.45848	1.36094	50.027
3	0.0500	0.01374	-1.38498	1.27329	50.009
4	0.0750	0.01798	-1.31148	1.18572	49.969
5	0.1000	0.02220	-1.23798	1.09839	49.843
6	0.1250	0.02635	-1.16448	1.01163	49.594
7	0.1500	0.03041	-1.09099	0.92584	49.212
8	0.1750	0.03433	-1.01749	0.84140	48.678
9	0.2000	0.03809	-0.94399	0.75888	47.897
10	0.2300	0.04233	-0.85579	0.66338	46.589
11	0.2600	0.04623	-0.76759	0.57252	45.085
12	0.2900	0.04976	-0.67940	0.48651	43.462
13	0.3200	0.05292	-0.59120	0.40515	41.938
14	0.3500	0.05569	-0.50300	0.32781	40.580
15	0.3800	0.05805	-0.41480	0.25395	39.314
16	0.4100	0.06001	-0.32660	0.18325	38.129
17	0.4400	0.06155	-0.23840	0.11540	37.016

PHASE II ROTOR

STAGE 2. ROTOR   NB   20

COORD SYSTEM ORIGIN Z -7.03630 R O.   MU O.   ETA O.

SECTION NO 6   SECTION FF   RHO 6.0000

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA·
18	0.4700	0.06265	-0.15021	0.05016	35.970
19	0.5000	0.06330	-0.06201	-0.01263	34.921
20	0.5300	0.06350	0.02619	-0.07300	33.858
21	0.5600	0.06324	0.11439	-0.13101	32.817
22	0.5900	0.06253	0.20259	-0.18679	31.808
23	0.6200	0.06138	0.29078	-0.24046	30.835
24	0.6500	0.05978	0.37898	-0.29213	29.895
25	0.6800	0.05775	0.46718	-0.34189	28.962
26	0.7100	0.05528	0.55538	-0.38976	28.028
27	0.7400	0.05235	0.64358	-0.43581	27.112
28	0.7700	0.04898	0.73177	-0.48010	26.218
29	0.8000	0.04514	0.81997	-0.52271	25.357
30	0.8300	0.04081	0.90817	-0.56373	24.533
31	0.8600	0.03597	0.99637	-0.60323	23.718
32	0.8900	0.03064	1.08457	-0.64123	22.904
33	0.9200	0.02478	1.17276	-0.67776	22.086
34	0.9500	0.01826	1.26096	-0.71281	21.264
35	0.9750	0.01232	1.33446	-0.74088	20.516
36	1.0000	0.00611	1.40796	-0.76778	19.665

CHORD 3.6818   STAGGER 37.012   CAMBER 3C.334

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER ALPHA	UPPER UPSILON	LOWER ALPHA	LOWER UPSILON
1	0.00533	-1.53198	1.44860	-1.53198	1.44860
2	0.00533	-1.53571	1.44120	-1.52405	1.45099
3	0.00533	-1.53371	1.43436	-1.51765	1.44782
4	0.00952	-1.47191	1.34969	-1.44505	1.37220
5	0.01374	-1.40436	1.25703	-1.36560	1.28955
6	0.01798	-1.33683	1.16443	-1.28613	1.20701
7	0.02220	-1.26922	1.07204	-1.20675	1.12474
8	0.02635	-1.20143	0.98019	-1.12754	1.04308
9	0.03041	-1.13337	0.88927	-1.04860	0.96241
10	0.03433	-1.06495	0.79967	-0.97002	0.88313
11	0.03809	-0.99601	0.71187	-0.89197	0.80589
12	0.04233	-0.91239	0.60983	-0.79919	0.71693
13	0.04623	-0.82786	0.51244	-0.70733	0.63261
14	0.04976	-0.74241	0.42002	-0.61638	0.55300

84

PHASE II ROTOR

ZPC

STAGE   2.   ROTOR   NB   20

COORD SYSTEM ORIGIN Z -7.03630   R 0.   MU 0.   ETA 0.

SECTION NO   6   SECTION FF   RHO 6.0000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER ALPHA	UPPER UPSILON	LOWER ALPHA	LOWER UPSILON
15	0.05292	-0.65630	0.33269	-0.52609	0.47762
16	0.05569	-0.56968	0.24995	-0.43631	0.40566
17	0.05805	-0.48251	0.17127	-0.34709	0.33663
18	0.06001	-0.3548	0.09635	-0.25839	0.27015
19	0.06155	-0.30662	0.02494	-0.17019	0.20587
20	0.06265	-0.21794	-0.04317	-0.08247	0.14350
21	0.06330	-0.12872	-0.10818	0.00470	0.08292
22	0.06350	-0.03894	-0.17008	0.09132	0.02408
23	0.06324	0.05129	-0.22886	0.17748	-0.03317
24	0.06253	0.14191	-0.28462	0.26326	-0.08896
25	0.06138	0.23287	-0.33748	0.34870	-0.14344
26	0.05978	0.32413	-0.38754	0.43384	-0.19672
27	0.05775	0.41570	-0.43490	0.51866	-0.24887
28	0.05528	0.50756	-0.47959	0.60319	-0.29994
29	0.05235	0.59965	-0.52160	0.68750	-0.35002
30	0.04898	0.69194	-0.56099	0.77141	-0.39921
31	0.04514	0.78439	-0.59779	0.85556	-0.44762
32	0.04081	0.87698	-0.63207	0.93936	-0.49539
33	0.03597	0.96973	-0.66386	1.02301	-0.54260
34	0.03064	1.06261	-0.69320	1.10652	-0.58927
35	0.02478	1.15561	-0.72003	1.18992	-0.63549
36	0.01826	1.24877	-0.74415	1.27316	-0.68148
37	0.01232	1.32652	-0.76211	1.34241	-0.71964
38	0.00611	1.39311	-0.77615	1.40185	-0.75189
39	0.00611	1.40125	-0.77516	1.40761	-0.75809
40	0.00611	1.40796	-0.76776	1.40796	-0.76778

| LE RAD | 0.01050 | CENTER AT ALPHA | -1.52523 | UPSILON | 1.44055 |
| TE RAD | 0.01303 | CENTER AT ALPHA | 1.39569 | UPSILON | -0.76337 |

85

PHASE II ROTOR

.ZPC.

STAGE 2 ROTOR NB 20

COORD SYSTEM ORIGIN Z -7.03630 R O. MU O. ETA O.

SECTION NO 6 SECTION FF RHO 6.0000

CHORD STAGGER CAMBER
3.6818 37.012 30.334

AREA 0.587748 SURFACE ARC LENGTH 7.51741

	ALPHA	UPSILON
SECTION C.G.	-0.09042	0.08617
STREAMSURFACE SECTION C.G.	-0.12484	0.08909
BLADE AXIS	-0.12484	0.08909
STACKING AXIS (RADIAL)	-0.00010	0.

86

PHASF II ROTOR

STAGE 2. ROTOR

CUORD SYSTEM ORIGIN Z -7.03630 R 0. MU 0. NB 20 ETA 0.

SECTION NO 7 SECTION GG RIIO 5.50C0

MEANLINE INPUT DATA

PT	ALPHA	ZETA*	THICKNESS	UPSILON
1	-1.58083	48.747	0.01862	1.32840
2	-1.50877	48.638	0.03567	1.24608
3	-1.36315	48.242	0.07011	1.08132
4	-1.21579	47.397	0.10419	0.91819
5	-1.06685	45.834	0.13685	0.76011
6	-0.90150	43.184	0.16983	0.59705
7	-0.71964	39.783	0.20092	0.43631
8	-0.53663	36.830	0.22625	0.29226
9	-0.35266	34.240	0.24543	0.16118
10	-0.16796	31.944	0.25800	0.04105
11	0.01741	29.449	0.26337	-0.06847
12	0.20333	26.742	0.26119	-0.16722
13	0.39000	23.767	0.25147	-0.25461
14	0.57729	20.680	0.23412	-0.33033
15	0.76529	17.720	0.20876	-0.39489
16	0.95394	14.874	0.17480	-0.44919
17	1.14335	11.967	0.13120	-0.49392
18	1.33309	8.690	0.07643	-0.52871
19	1.49117	5.425	0.02110	-0.54873

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA*
1	0.0250	0.00517	-1.58083	1.32840	48.747
2	0.0500	0.01022	-1.50403	1.24068	48.755
3	0.0500	0.01527	-1.42723	1.15147	48.503
4	0.0750	0.02030	-1.35043	1.06706	48.229
5	0.1000	0.02527	-1.27363	0.98163	47.837
6	0.1250	0.03013	-1.19683	0.89761	47.269
7	0.1500	0.03485	-1.12003	0.81553	46.502
8	0.1750	0.03939	-1.04323	0.73592	45.519
9	0.2000	0.04371	-0.96643	0.65926	44.337
10	0.2300	0.04857	-0.87427	0.57174	42.658
11	0.2600	0.05302	-0.78211	0.48936	40.920
12	0.2900	0.05707	-0.68995	0.41183	39.229
13	0.3200	0.06068	-0.59779	0.33868	37.675
14	0.3500	0.06387	-0.50563	0.26930	36.301
15	0.3800	0.06661	-0.41347	0.20317	35.027
16	0.4100	0.06890	-0.32131	0.14001	33.827
17	0.4400	0.07072	-0.22915	0.07963	32.629

PHASE II ROTOR

COORD SYSTEM ORIGIN Z -7.03630 R 0.

STAGE 2   ROTOR   NR 20

MU 0.   ETA 0.

RHO 5.5000

SECTION NO 7   SECTION GG

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA
18	0.4700	0.07206	-0.13699	0.02199	31.410
19	0.5000	0.07289	-0.04483	-0.03292	30.163
20	0.5300	0.07320	0.04733	-0.08512	28.882
21	0.5600	0.07299	0.13949	-0.13458	27.541
22	0.5900	0.07227	0.23165	-0.18127	26.130
23	0.6200	0.07105	0.32381	-0.22498	24.658
24	0.6500	0.06931	0.41597	-0.26582	23.132
25	0.6800	0.06706	0.50813	-0.30374	21.599
26	0.7100	0.06429	0.60029	-0.33882	20.083
27	0.7400	0.06099	0.69245	-0.37117	18.604
28	0.7700	0.05713	0.78461	-0.40092	17.176
29	0.8000	0.05272	0.87677	-0.42818	15.792
30	0.8300	0.04769	0.96893	-0.45308	14.451
31	0.8600	0.04204	1.06109	-0.47569	13.108
32	0.8900	0.03573	1.15325	-0.49599	11.738
33	0.9200	0.02872	1.24541	-0.51395	10.290
34	0.9500	0.02082	1.33757	-0.52940	8.725
35	0.9750	0.01352	1.41437	-0.54019	7.219
36	1.0000	0.00586	1.49117	-0.54873	5.425

CHORD 3.6001

STAGGER 31.427

CAMBER 43.322

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER ALPHA	UPPER UPSILON	LOWER ALPHA	LOWER UPSILON
1	0.00517	-1.58083	1.32840	-1.58083	1.32840
2	0.00517	-1.58426	1.32127	-1.57335	1.33084
3	0.00517	-1.58227	1.31481	-1.56717	1.32801
4	0.01022	-1.51786	1.22855	-1.49020	1.25280
5	0.01527	-1.44782	1.13525	-1.40664	1.17169
6	0.02030	-1.37769	1.04272	-1.32317	1.09141
7	0.02527	-1.30734	0.95109	-1.23991	1.01216
8	0.03013	-1.23667	0.86081	-1.15699	0.93441
9	0.03485	-1.16553	0.77235	-1.07453	0.85871
10	0.03939	-1.09381	0.68624	-0.99264	0.78559
11	0.04371	-1.02142	0.60298	-0.91144	0.71553
12	0.04857	-0.93351	0.50744	-0.81503	0.63603
13	0.05302	-0.84463	0.41724	-0.71959	0.56148
14	0.05707	-0.75491	0.33226	-0.62499	0.49141

PHASE II ROTOR

STAGE 2. ROTOR   NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU 0.   ETA 0.

SECTION NO 7   SECTION GG   RHO 5.5000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

		UPPER		LOWER	
PT	T/C	ALPHA	UPSILON	ALPHA	UPSILON
15	0.06068	-0.66455	0.25223	-0.53103	0.42514
16	0.06387	-0.57369	0.17664	-0.43757	0.36195
17	0.06661	-0.48229	0.10498	-0.34465	0.30136
18	0.06890	-0.39035	0.03698	-0.25227	0.24304
19	0.07072	-0.29779	-0.02758	-0.16051	0.18685
20	0.07206	-0.20459	-0.08871	-0.06939	0.13269
21	0.07289	-0.11075	-0.14636	0.02109	0.08051
22	0.07320	-0.01631	-0.20050	0.11097	0.03025
23	0.07299	0.07873	-0.25108	0.20024	-0.01807
24	0.07227	0.17435	-0.29802	0.28895	-0.06442
25	0.07105	0.27045	-0.34121	0.37716	-0.10875
26	0.06931	0.36696	-0.38055	0.46498	-0.15109
27	0.06706	0.46369	-0.41598	0.55256	-0.19150
28	0.06429	0.56055	-0.44752	0.64003	-0.23013
29	0.06099	0.65743	-0.47521	0.72747	-0.26713
30	0.05713	0.75424	-0.49917	0.81498	-0.30266
31	0.05272	0.85094	-0.51949	0.90259	-0.33687
32	0.04769	0.94750	-0.53622	0.99035	-0.36994
33	0.04204	1.04393	-0.54939	1.07825	-0.40198
34	0.03573	1.14016	-0.55897	1.16633	-0.43302
35	0.02872	1.23617	-0.56481	1.25464	-0.46308
36	0.02082	1.33188	-0.56645	1.34325	-0.49235
37	0.01352	1.41131	-0.56433	1.41743	-0.51604
38	0.00586	1.47934	-0.56011	1.47834	-0.53429
39	0.00586	1.48656	-0.55718	1.48769	-0.53830
40	0.00586	1.49117	-0.54873	1.49117	-0.54873

| LE RAD | 0.01006 | CENTER AT ALPHA | -1.57421 | UPSILON | 1.32082 |
| TE RAD | 0.01293 | CENTER AT ALPHA | 1.47833 | UPSILON | -0.54722 |

PHASE II ROTOR

◆ZPC◆

STAGE 2. ROTOR NB 20

COORD SYSTEM ORIGIN Z -7.03630 & 0. MU 0. ETA 0.

SECTION NO 7 SECTION GG RHO 5.5000

CHORD STAGGER CAMBER
3.6001 31.427 43.322

AREA 0.652761 SURFACE ARC LENGTH 7.43904

	ALPHA	UPSILON
SECTION C.G.	-0.07133	0.07206
STREAMSURFACE SECTION C.G.	-0.10174	0.05906
BLADE AXIS	-0.10174	0.05906
STACKING AXIS (RADIAL)	-0.00010	0.

·ZPC·

STAGE 2. ROTOR   NB 20

COORD SYSTEM ORIGIN Z -7.03600   R O.   MU O.   ETA O.

SECTION NO 6   SECTION H: RHO 5.0000

MEANLINE INPUT DATA

PT	ALPHA	ZETA	THICKNESS	UPSILON
1	-1.58945	47.036	0.01924	1.18885
2	-1.51240	46.789	0.03853	1.10657
3	-1.35737	46.051	0.07708	0.94369
4	-1.20150	44.584	0.11458	0.78586
5	-1.04524	42.215	0.14984	0.63789
6	-0.87305	39.64	0.18486	0.49008
7	-0.68516	36.041	0.21777	0.34567
8	-0.49737	33.221	0.24471	0.21605
9	-0.30963	30.491	0.26521	0.09930
10	-0.12218	27.728	0.27873	-0.00544
11	0.06503	24.784	0.28475	-0.09829
12	0.25196	21.564	0.28288	-0.17887
13	0.43845	18.220	0.27288	-0.24687
14	0.62433	14.798	0.25447	-0.30262
15	0.80904	11.023	0.22721	-0.34593
16	0.99201	6.654	0.19027	-0.37543
17	1.17186	1.232	0.14278	-0.38874
18	1.34713	-6.337	0.08449	-0.38165
19	1.48814	-15.381	0.02862	-0.35455

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AI	T/C	ALPHA	UPSILON	ZETA
1	0.	0.00559	-1.58945	1.18885	47.036
2	0.0250	0.01118	-1.51251	1.10668	46.740
3	0.0500	0.01677	-1.43557	1.02533	46.434
4	0.0750	0.02230	-1.35863	0.94500	46.012
5	0.1000	0.02774	-1.28169	0.86606	45.418
6	0.1250	0.03306	-1.20475	0.78906	44.588
7	0.1500	0.03821	-1.12781	0.71455	43.534
8	0.1750	0.04317	-1.05087	0.64300	42.272
9	0.2000	0.04789	-0.97393	0.57473	40.890
10	0.2300	0.05322	-0.88160	0.49705	39.261
11	0.2600	0.05816	-0.78927	0.42369	37.688
12	0.2900	0.06270	-0.69695	0.35427	36.199
13	0.3200	0.06683	-0.60462	0.28843	34.789
14	0.3500	0.07052	-0.51229	0.22590	33.431
15	0.3800	0.07377	-0.41996	0.16646	32.112
16	0.4100	0.07654	-0.32764	0.10998	30.798
17	0.4400	0.07884	-0.23531	0.05637	29.477

PHASE II ROTOR

STAGE 2. ROTOR NB 20

COORD SYSTEM ORIGIN Z -7.03630 R O. MU O. ETA O.

SECTION NO 8 SECTION IH RHO 5.0000

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA·
18	0.4700	0.08063	-0.14298	0.00561	28.124
19	0.5000	0.08189	-0.05065	-0.04232	26.729
20	0.5300	0.08261	0.04168	-0.08736	25.269
21	0.5600	0.08278	0.13400	-0.12946	23.740
22	0.5900	0.08238	0.22633	-0.16856	22.146
23	0.6200	0.08140	0.31866	-0.20461	20.502
24	0.6500	0.07984	0.41099	-0.23763	18.854
25	0.6800	0.07768	0.50331	-0.26768	17.201
26	0.7100	0.07490	0.59564	-0.29479	15.522
27	0.7400	0.07149	0.68797	-0.31895	13.787
28	0.7700	0.06741	0.78030	-0.34003	11.906
29	0.8000	0.06261	0.87263	-0.35781	9.854
30	0.8300	0.05705	0.96495	-0.37200	7.576
31	0.8600	0.05065	1.05728	-0.38225	5.032
32	0.8900	0.04336	1.14961	-0.38806	2.116
33	0.9200	0.03516	1.24194	-0.38879	-1.375
34	0.9500	0.02592	1.33426	-0.38306	-5.898
35	0.9750	0.01735	1.41120	-0.37211	-10.385
36	1.0000	0.00831	1.48814	-0.35455	-15.381

CHORD 1.4429

STAGGER 26.634

CAMBER 62.417

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER ALPHA	UPSILON	LOWER ALPHA	UPSILON
1	0.00559	-1.58945	1.18885	-1.58945	1.18885
2	0.00559	-1.59278	1.18133	-1.58181	1.19165
3	0.00559	-1.59054	1.17471	-1.57528	1.18896
4	0.01118	-1.52653	1.09349	-1.49849	1.11988
5	0.01677	-1.45648	1.00544	-1.41466	1.04522
6	0.02230	-1.38625	0.91834	-1.33101	0.97166
7	0.02774	-1.31570	0.83254	-1.24768	0.89359
8	0.03306	-1.24470	0.74853	-1.16480	0.82959
9	0.03821	-1.17312	0.66686	-1.08250	0.76224
10	0.04317	-1.10086	0.58801	-1.00088	0.69799
11	0.04789	-1.02789	0.51241	-0.91996	0.63705
12	0.05322	-0.93958	0.42612	-0.82362	0.56799
13	0.05816	-0.85049	0.34445	-0.72806	0.50292
14	0.06270	-0.76070	0.26717	-0.63320	0.44137

PHASE II ROTOR

STAGE 2. ROTOR   NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU 0.   FIA 0.

SECTION NO 8   SECTION HH   RHD 5.0000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER ALPHA	UPPER UPSILON	LOWER ALPHA	LOWER UPSILON
15	0.06683	-0.67026	0.19395	-0.53898	0.38291
16	0.07052	-0.57918	0.12459	0.44541	0.32722
17	0.07377	-0.48747	0.05891	-0.35245	0.27402
18	0.07654	-0.39510	-0.00320	-0.26017	0.22317
19	0.07884	-0.30209	-0.06178	-0.16853	0.17452
20	0.08063	-0.20841	-0.11680	-0.07755	0.12801
21	0.08189	-0.11406	-0.16823	0.01275	0.08359
22	0.08261	-0.01903	-0.21597	0.10238	0.04124
23	0.08278	0.07663	-0.25990	0.19137	0.00098
24	0.08238	0.17287	-0.29991	0.27979	-0.03721
25	0.08140	0.26958	-0.33586	0.36774	-0.07335
26	0.07984	0.36657	-0.36769	0.45540	-0.10756
27	0.07768	0.46377	-0.39542	0.54286	-0.13994
28	0.07490	0.56114	-0.41903	0.63015	-0.17055
29	0.07149	0.65864	-0.43848	0.71730	-0.19943
30	0.06741	0.75636	-0.45357	0.80424	-0.22649
31	0.06261	0.85418	-0.46401	0.89107	-0.25161
32	0.05705	0.95200	-0.46935	0.97790	-0.27454
33	0.05065	1.04963	-0.46910	1.06493	-0.29540
34	0.04336	1.14685	-0.46266	1.15236	-0.31347
35	0.03516	1.24339	-0.44930	1.24048	-0.32828
36	0.02592	1.33885	-0.42744	1.32968	-0.33867
37	0.01735	1.41659	-0.40149	1.40582	-0.34273
38	0.00831	1.47880	-0.37474	1.47038	-0.34164
39	0.00831	1.48601	-0.36835	1.48148	-0.34489
40	0.00831	1.48814	-0.35455	1.48814	-0.35455

LF RAD 0.01047   CENTER AT ALPHA -1.58230   UPSILON 1.18118
TE RAD 0.01741   CENTER AT ALPHA 1.47132   UPSILON -0.35902

PHASE II ROTOR

STAGE 2 ROTOR NR 20

COORD SYSTEM ORIGIN Z -7.03630 R 0. MU 0. ETA 0.

SECTION NO 8 SECTION HH RHO 5.0000

CHORD STAGGER CAMBER
3.4429 26.634 62.417

AREA 0.685861 SURFACE ARC LENGTH 7.22076

	ALPHA	UPSILON
SECTION C.G.	-0.04751	0.04915
STREAMSURFACE SECTION C.G.	-0.05316	0.02316
BLADE AXIS	-0.05316	0.02316
STACKING AXIS (RADIAL)	-0.00010	0.

PHASE II ROTOR

STAGE 2. ROTOR   NB 20

COORD SYSTEM ORIGIN Z -7.03630 R O.   MU O.   RHO O.   ETA O.

SECTION NO 9   SECTION JJ   RHO 4.5000

MEANLINE INPUT DATA

PT	ALPHA	ZETA*	THICKNESS	UPSILON
1	-1.55866	45.475	0.02123	1.04206
2	-1.47949	45.199	0.04191	0.96197
3	-1.32124	44.308	0.08282	0.80502
4	1.16345	42.533	0.12214	0.65547
5	1.00636	39.886	0.15378	0.51780
6	0.83429	36.770	0.19510	0.38184
7	0.64756	33.559	0.22936	0.24998
8	-0.46205	30.300	0.25761	0.13394
9	0.27774	27.042	0.27942	0.03286
10	0.09472	23.964	0.29430	-0.05457
11	0.08653	20.783	0.30183	-0.12935
12	0.26585	17.355	0.30158	-0.19140
13	0.44258	13.632	0.29332	-0.24063
14	0.61619	9.065	0.27699	-0.27590
15	0.78564	3.224	0.25209	-0.29452
16	0.94986	-4.288	0.21766	-0.29370
17	1.10760	-14.950	0.17224	-0.26842
18	1.25731	-29.464	0.11713	-0.20772
19	1.37538	-42.294	0.07093	-0.11926

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA*
1	0.0250	0.00673	-1.55866	1.04206	45.475
2	0.0500	0.01280	-1.48531	0.96782	45.206
3	0.0500	0.01885	-1.41196	0.89438	44.850
4	0.0750	0.02484	-1.33861	0.82198	44.378
5	0.1000	0.03074	-1.26525	0.75094	43.753
6	0.1250	0.03651	-1.19190	0.68171	42.888
7	0.1500	0.04212	-1.11855	0.61484	41.792
8	0.1750	0.04754	-1.04520	0.55065	40.563
9	0.2000	0.05274	-0.97185	0.48932	39.223
10	0.2300	0.05866	-0.88383	0.41947	37.648
11	0.2600	0.06421	-0.79581	0.35339	36.148
12	0.2900	0.06938	-0.70779	0.29083	34.655
13	0.3200	0.07415	-0.61977	0.23166	33.154
14	0.3500	0.07850	-0.53174	0.17582	31.621
15	0.3800	0.08242	-0.44372	0.12326	30.048
16	0.4100	0.08588	-0.35570	0.07394	28.475
17	0.4400	0.08887	-0.26768	0.02773	26.925

PHASE II ROTOR

STAGE 2. ROTOR   NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU 0.   ETA 0.

SECTION NO 9   SECTION JJ   RHO 4.5000

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA·
18	0.4700	0.09135	-0.17966	-0.01551	25.408
19	0.5000	0.09333	-0.05164	-0.05594	23.930
20	0.5300	0.09476	-0.03362	-0.09364	22.423
21	0.5600	0.09564	0.08440	-0.12854	20.821
22	0.5900	0.09593	0.17243	-0.16056	19.156
23	0.6200	0.09561	0.26045	-0.18970	17.468
24	0.6500	0.09467	0.34847	-0.21594	15.705
25	0.6800	0.09309	0.43649	-0.23914	13.799
26	0.7100	0.09085	0.52451	-0.25907	11.662
27	0.7400	0.08792	0.61253	-0.27531	9.177
28	0.7700	0.08423	0.70055	-0.28735	6.335
29	0.8000	0.07973	0.78857	-0.29469	3.135
30	0.8300	0.07430	0.87660	-0.29672	-0.596
31	0.8600	0.06781	0.96462	-0.29251	-5.001
32	0.8900	0.06011	1.05264	-0.28066	-10.542
33	0.9200	0.05098	1.14066	-0.25893	-17.463
34	0.9500	0.04063	1.22868	-0.22332	-26.864
35	0.9750	0.03160	1.30203	-0.17875	-35.399
36	1.0000	0.02248	1.37538	-0.11926	-42.294

CHORD 3.1555   STAGGER 21.594   CAMBER 87.769

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

		UPPER		LOWER	
PT	T/C	ALPHA	UPSILON	ALPHA	UPSILON
1	0.00673	-1.55866	1.04206	-1.55866	1.04206
2	0.00673	-1.56213	1.03365	-1.55030	1.04540
3	0.00673	-1.55950	1.02640	-1.54300	1.04266
4	0.01280	-1.49964	0.95359	-1.47097	0.98205
5	0.01885	-1.43293	0.87329	-1.39098	0.91546
6	0.02484	-1.36602	0.79397	-1.31119	0.84999
7	0.03074	-1.29879	0.71591	-1.23172	0.78597
8	0.03651	-1.23111	0.63951	-1.15270	0.72392
9	0.04212	-1.16284	0.56529	-1.07427	0.66438
10	0.04754	-1.09397	0.49367	-0.99643	0.60762
11	0.05274	-1.02446	0.42486	-0.91924	0.55377
12	0.05866	-0.94036	0.34620	-0.82730	0.49275
13	0.06421	-0.85557	0.27159	-0.73605	0.43520
14	0.06938	-0.77003	0.20079	-0.64554	0.38087

PHASE II ROTOR

+ZPC+

STAGE 2. ROTOR   NR 20

COORD SYSTEM ORIGIN 7 -7.03630 R 0.   MU 0.   ETA 0.

SECTION NO 9   SECTION JJ   RHO 4.5000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER ALPHA	UPPER UPSILON	LOWER ALPHA	LOWER UPSILON
15	0.07415	-0.68374	0.13372	-0.55579	0.32960
16	0.07850	-0.59668	0.07035	-0.46681	0.28128
17	0.08242	-0.50883	0.01071	-0.37861	0.23582
18	0.08588	-0.42030	-0.04516	-0.29110	0.19305
19	0.08887	-0.33117	-0.09728	-0.20419	0.15274
20	0.09135	-0.24150	-0.14571	-0.11782	0.11468
21	0.09333	-0.15136	-0.19052	-0.03191	0.07867
22	0.09476	-0.06065	-0.23184	0.05341	0.04457
23	0.09564	0.03077	-0.26958	0.13804	0.01250
24	0.09593	0.12276	-0.30353	0.22209	-0.01760
25	0.09561	0.21517	-0.33360	0.30573	-0.04580
26	0.09467	0.30804	-0.35973	0.38890	-0.07215
27	0.09309	0.40146	-0.38177	0.47152	-0.09651
28	0.09085	0.49554	-0.39946	0.55349	-0.11869
29	0.08792	0.59041	-0.41225	0.63465	-0.13837
30	0.08423	0.68589	-0.41944	0.71522	-0.15526
31	0.07973	0.78170	-0.42028	0.79545	-0.16909
32	0.07430	0.87782	-0.41394	0.87538	-0.17951
33	0.06781	0.97394	-0.39909	0.95529	-0.18593
34	0.06011	1.06999	-0.37390	1.03529	-0.18743
35	0.05098	1.16480	-0.33566	1.11652	-0.18220
36	0.04063	1.25764	-0.28050	1.19972	-0.16614
37	0.03160	1.33091	-0.21938	1.27315	-0.13811
38	0.02248	1.37506	-0.17369	1.32367	-0.11084
39	0.02248	1.38488	-0.15355	1.35185	-0.10588
40	0.02248	1.37538	-0.11926	1.37538	-0.11926

LE RAD	0.01163	CENTER AT ALPHA	-1.55050	UPSILON	1.03377
TE RAD	0.04109	CENTER AT ALPHA	1.34444	UPSILON	-0.14629

97

ZPC

STAGE 2. ROTOR NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0. MU 0. ETA 0.

SECTION NO 9 SECTION JJ RHO 4.5000

CHORD 3.1555 STAGGER 21.594 CAMBER 87.769

AREA 0.697579 SURFACE ARC LENGTH 6.86662

	ALPHA	UPSILON
SECTION C.G.	-0.02725	0.01943
SIRFAMSURFACE SECTION C.G.	-0.01871	-0.01956
BLADE AXIS	-0.01871	-0.01956
STACKING AXIS (RADIAL)	-0.00010	0.

PHASE II ROTOR

STAGE 2. ROTOR NR 20 FTA 0.

COORD SYSTEM ORIGIN Z -7.03630 R 0. MU 0. RHO 4.0000 FTA 0.

SECTION NO 10 SECTION KK

MEANLINE INPUT DATA

PI	ALPHA	ZETA·	THICKNESS	UPSILON
1	-1.52161	44.524	0.02360	0.90540
2	-1.44316	44.060	0.04515	0.82930
3	-1.28718	42.745	0.08746	0.68224
4	-1.13275	40.581	0.12790	0.54463
5	-0.97981	37.597	0.16566	0.42006
6	-0.81316	34.113	0.20327	0.29940
7	-0.63318	30.555	0.23898	0.18522
8	-0.45508	26.939	0.26891	0.08719
9	-0.27895	23.401	0.29260	0.00421
10	-0.10491	20.257	0.30942	-0.06569
11	0.06674	17.174	0.31900	0.12395
12	0.23556	13.736	0.32103	-0.17061
13	0.40065	9.515	0.31553	-0.20446
14	0.56112	4.038	0.30244	-0.22346
15	0.71606	-3.831	0.28098	-0.22400
16	0.86434	-15.612	0.24860	-0.19849
17	1.00480	-31.445	0.20287	-0.13479
18	1.13688	-47.35C	0.15125	-0.01822
19	1.24022	-57.879	0.11714	0.13001

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA·
1	0	0.00823	-1.52161	0.90540	44.524
2	0.0250	0.01484	-1.45256	0.83834	43.880
3	0.0500	0.02142	-1.38352	0.77238	43.477
4	0.0750	0.02794	-1.31447	0.70751	42.921
5	0.1000	0.03436	-1.24543	0.64408	42.194
6	0.1250	0.04067	-1.17638	0.58246	41.265
7	0.1500	0.04683	-1.10734	0.52305	40.121
8	0.1750	0.05283	-1.03829	0.46615	38.832
9	0.2000	0.05862	-0.96924	0.41194	37.413
10	0.2300	0.06527	-0.88639	0.35054	35.675
11	0.2600	0.07157	-0.80354	0.29289	33.986
12	0.2900	0.07749	-0.72068	0.23876	32.327
13	0.3200	0.08301	-0.63783	0.18797	30.689
14	0.3500	0.08813	-0.55497	0.14038	29.044
15	0.3800	0.09283	-0.47212	0.09594	27.354
16	0.4100	0.09708	-0.38926	0.05463	25.653
17	0.4400	0.10086	-0.30641	0.01629	24.016

PHASE II ROTOR

	STAGE	2.	ROTOR		NB	20	
COORD SYSTEM ORIGIN Z	-7.03630	R	0.	MU	0	FTA	0.
SECTION NO 10		SECTION KK			RHO	4.0000	

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA•
18	0.4700	0.10412	-0.22355	-0.01927	22.449
19	0.5000	0.10685	-0.14070	-0.05222	20.934
20	0.5300	0.10903	-0.05784	-0.08270	19.457
21	0.5600	0.11063	0.02501	-0.11075	17.938
22	0.5900	0.11162	0.10787	-0.13633	16.354
23	0.6200	0.11198	0.19072	-0.15932	14.630
24	0.6500	0.11170	0.27358	-0.17952	12.739
25	0.6800	0.11077	0.35643	-0.19667	10.606
26	0.7100	0.10915	0.43929	-0.21043	8.191
27	0.7400	0.10681	0.52214	-0.22032	5.343
28	0.7700	0.10366	0.60500	-0.22570	1.962
29	0.8000	0.09959	0.68785	-0.22556	-2.322
30	0.8300	0.09436	0.77070	-0.21842	-7.834
31	0.8600	0.08766	0.85356	-0.20158	-15.430
32	0.8900	0.07915	0.93641	-0.17158	-24.410
33	0.9200	0.06878	1.01927	-0.12544	-33.734
34	0.9500	0.05731	1.10212	-0.05696	-45.464
35	0.9750	0.04855	1.17117	0.02683	-54.418
36	1.0000	0.04084	1.24022	0.13001	-57.046

CHORD	STAGGER	CAMBER
2.8686	15.682	101.570

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER ALPHA	UPSILON	LOWER ALPHA	UPSILON
1	0.00823	-1.52161	0.90540	-1.52161	0.90540
2	0.00823	-1.52532	0.89592	-1.51239	0.90931
3	0.00823	-1.52227	0.88792	-1.50416	0.90645
4	0.01484	-1.46732	0.82300	-1.43781	0.85368
5	0.02142	-1.40466	0.75009	-1.36238	0.79467
6	0.02794	-1.34176	0.67817	-1.28719	0.73685
7	0.03436	-1.27853	0.60757	-1.21233	0.68059
8	0.04067	-1.21485	0.53861	-1.13791	0.62631
9	0.04683	-1.15062	0.47168	-1.06405	0.57442
10	0.05283	-1.08580	0.40713	-0.99078	0.52518
11	0.05862	-1.02033	0.34516	-0.91816	0.47873
12	0.06527	-0.94099	0.27448	-0.83179	0.42659
13	0.07157	-0.86092	0.20777	-0.74615	0.37801
14	0.07749	-0.78011	0.14484	-0.66125	0.33267

PHASE II ROTOR

STAGE 2. ROTOR   NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0   MU 0.   ETA 0.

SECTION NO 10   SECTION KK   RHO 4.0000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER		LOWER	
		ALPHA	UPSILON	ALPHA	UPSILON
15	0.08301	-0.69859	0.08558	-0.57706	0.29035
16	0.08813	-0.61634	0.02986	-0.49360	0.25089
17	0.09283	-0.53329	-0.02232	-0.41094	0.21420
18	0.09708	-0.44954	-0.07089	-0.32898	0.18015
19	0.10086	-0.36528	-0.11585	-0.24753	0.14843
20	0.10412	-0.28058	-0.15730	-0.16652	0.11876
21	0.10685	-0.19546	-0.19537	-0.08594	0.09092
22	0.10903	-0.10993	-0.23016	-0.00575	0.06475
23	0.11063	-0.02386	-0.26171	0.07388	0.04021
24	0.11162	0.06279	-0.28995	0.15295	0.01729
25	0.11198	0.15015	-0.31472	0.23129	-0.00391
26	0.11170	0.23825	-0.33579	0.30891	-0.02325
27	0.11077	0.32719	-0.35283	0.38567	-0.04051
28	0.10915	0.41698	-0.36539	0.46159	-0.05547
29	0.10681	0.50788	-0.37285	0.53641	-0.06780
30	0.10366	0.59990	-0.37430	0.61009	-0.07710
31	0.09959	0.69364	-0.36828	0.68206	-0.08283
32	0.09436	0.78915	-0.35250	0.75226	-0.08434
33	0.08766	0.88701	-0.32279	0.82011	-0.08038
34	0.07915	0.98333	-0.27496	0.88950	-0.06821
35	0.06878	1.07406	-0.20748	0.96448	-0.04339
36	0.05731	1.16072	-0.11461	1.04353	0.00069
37	0.04855	1.22781	-0.01369	1.11453	0.06735
38	0.04084	1.26135	0.04574	1.15844	0.12049
39	0.04084	1.26878	0.08330	1.19762	0.14010
40	0.04084	1.24022	0.13001	1.24022	0.13001

LE RAD 0.01302   CENTER AT ALPHA -1.51230   UPSILON 0.89629
TE RAD 0.06414   CENTER AT ALPHA 1.20501   UPSILON 0.07639

PHASE II ROTOR

•ZPC•

STAGE   2.   ROTOR   NB   20

COORD SYSTEM ORIGIN Z -7.03630 R O.   MU O.   ETA O.

SECTION NO 10   SECTION KK   RHO   4.0000

CHORD   STAGGER   CAMBER
2.8686   15.682   101.570

AREA   .0.707968   SURFACE ARC LENGTH   6.58000

                                  ALPHA   UPSILON
SECTION C.G.   -0.01084   0.01549
STREAMSURFACE SECTION C.G.   -0.00448   -0.03053
BLADE AXIS   -0.00448   -0.03053
STACKING AXIS (RADIAL)   -0.00010   O.

PHASE II ROTOR

STAGE   2.   ROTOR   NB   20

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU 0.   ETA 0.

SECTION NO 11   SECTION LL   RHO 3.5000

MEANLINE INPUT DATA

PT	ALPHA	ZETA*	THICKNESS	UPSILON
1	-1.49717	42.238	0.02978	0.78390
2	-1.42129	41.440	0.05164	0.71535
3	-1.27064	39.527	0.09434	0.58563
4	-1.12163	36.910	0.13505	0.46726
5	-0.97408	33.735	0.17300	0.36234
6	-0.81336	30.420	0.21078	0.26187
7	-0.64003	27.190	0.24685	0.16690
8	-0.46870	23.921	0.27738	0.08551
9	-0.29979	20.875	0.30194	0.01673
10	-0.13345	18.128	0.32023	-0.04133
11	0.02984	15.178	0.33219	-0.08957
12	0.18955	11.546	0.33753	-0.12719
13	0.34490	7.050	0.33587	-0.15248
14	0.49485	0.684	0.32698	0.16277
15	0.63852	-9.897	0.30967	-0.15060
16	0.77417	-25.764	0.27943	-0.10227
17	0.89994	-43.801	0.23335	-0.00048
18	1.01597	-58.112	0.18537	0.17153
19	1.10502	-66.281	0.16336	0.37929

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA*
1	0.	0.01131	-1.49717	0.78390	42.238
2	0.0250	0.01843	-1.43212	0.72508	41.881
3	0.0500	0.02550	-1.36706	0.66760	41.027
4	0.0750	0.03249	-1.30201	0.61187	40.133
5	0.1000	0.03938	-1.23695	0.55792	39.187
6	0.1250	0.04615	-1.17190	0.50591	38.057
7	0.1500	0.05277	-1.10684	0.45617	36.714
8	0.1750	0.05921	-1.04179	0.40890	35.277
9	0.2000	0.06544	-0.97673	0.36411	33.804
10	0.2300	0.07261	-0.89867	0.31355	32.077
11	0.2600	0.07943	-0.82060	0.26612	30.499
12	0.2900	0.08586	-0.74254	0.22149	29.015
13	0.3200	0.09192	-0.66447	0.17951	27.523
14	0.3500	0.09758	-0.58640	0.14011	26.024
15	0.3800	0.10283	-0.50834	0.10326	24.510
16	0.4100	0.10764	-0.43027	0.06891	22.995
17	0.4400	0.11200	-0.35221	0.03694	21.553

PHASE II ROTOR

STAGE 2. ROTOR NB 20

COORD SYSTEM ORIGIN Z -7.03630 R O. MU O. ETA O.

SECTION NO 11 SECTION LL RHO 3.5000

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA•
18	0.4700	0.11588	-0.27414	0.00718	20.200
19	0.5000	0.11926	-0.19608	-0.02053	18.891
20	0.5300	0.12213	-0.11801	-0.04627	17.610
21	0.5600	0.12449	-0.03994	-0.07006	16.261
22	0.5900	0.12631	0.03812	-0.09177	14.795
23	0.6200	0.12755	0.11619	-0.11122	13.145
24	0.6500	0.12819	0.19425	-0.12813	11.264
25	0.6800	0.12817	0.27232	-0.14221	9.137
26	0.7100	0.12747	0.35038	-0.15314	6.751
27	0.7400	0.12602	0.42845	-0.16038	3.691
28	0.7700	0.12378	0.50652	-0.16276	-0.375
29	0.8000	0.12057	0.58458	-0.15861	-6.029
30	0.8300	0.11602	0.66265	-0.14537	-13.558
31	0.8600	0.10960	0.74071	-0.11906	-24.056
32	0.8900	0.10065	0.81878	-0.07362	-36.074
33	0.9200	0.08912	0.89684	-0.00382	-46.919
34	0.9500	0.07621	0.97491	0.09799	-57.900
35	0.9750	0.06768	1.03996	0.22252	-65.886
36	1.0000	0.06203	1.10502	0.37929	-68.180

CHORD 2.6335

STAGGER 8.838

CAMBER 110.418

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER ALPHA	UPSILON	LOWER ALPHA	UPSILON
1	0.01131	-1.49717	0.78390	-1.49717	0.78390
2	0.01131	-1.50146	0.77171	-1.48573	0.78929
3	0.01131	-1.49731	0.76175	-1.47514	0.78611
4	0.01843	-1.44831	0.70701	-1.41592	0.74314
5	0.02550	-1.38910	0.64227	-1.34502	0.69793
6	0.03249	-1.32958	0.57917	-1.27443	0.64458
7	0.03938	-1.26971	0.51773	-1.20419	0.59811
8	0.04615	-1.20936	0.45806	-1.13444	0.55376
9	0.05277	-1.14838	0.40046	-1.06530	0.51187
10	0.05921	-1.08681	0.34525	-0.99676	0.47255
11	0.06544	-1.02467	0.29251	-0.92879	0.43571
12	0.07261	-0.94944	0.23253	-0.84789	0.39456
13	0.07943	-0.87368	0.17601	-0.76752	0.35623
14	0.08586	-0.79737	0.12262	-0.68770	0.32036

PHASE II ROTOR

COORD SYSTEM ORIGIN Z -7.03630 R 0.   STAGE   2.   ROTOR   MU 0.   NB 20   ETA 0.

SECTION NO 11   SECTION LL   RHO 3.5000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER		LOWER	
		ALPHA	UPSILON	ALPHA	UPSILON
15	0.09192	-0.72040	0.07217	-0.60854	0.28684
16	0.09758	-0.64278	0.02465	-0.53003	0.25557
17	0.10283	-0.56451	-0.01993	-0.45217	0.22646
18	0.10764	-0.48564	-0.06156	-0.37490	0.19938
19	0.11200	-0.40638	-0.10022	-0.29803	0.17411
20	0.11588	-0.32683	-0.13601	-0.22146	0.15037
21	0.11926	-0.24691	-0.16910	-0.14524	0.12804
22	0.12213	-0.16666	-0.19955	-0.06936	0.10700
23	0.12449	-0.08584	-0.22742	0.00596	0.08730
24	0.12631	-0.00435	-0.25257	0.08059	0.06903
25	0.12755	0.07799	-0.27477	0.15438	0.05234
26	0.12819	0.16128	-0.29367	0.22722	0.03741
27	0.12817	0.24552	-0.30884	0.29912	0.02442
28	0.12747	0.33065	-0.31981	0.37012	0.01354
29	0.12602	0.41777	-0.32598	0.43913	0.00521
30	0.12378	0.50758	-0.32574	0.50545	0.00021
31	0.12057	0.60126	-0.31648	0.56791	-0.00073
32	0.11602	0.69846	-0.29387	0.62684	0.00314
33	0.10960	0.79954	-0.25084	0.68188	0.01273
34	0.10065	0.89682	-0.18075	0.74074	0.03350
35	0.08912	0.98255	-0.08396	0.81114	0.07633
36	0.07621	1.05992	0.04466	0.88990	0.15132
37	0.06768	1.12130	0.18611	0.95863	0.25893
38	0.06203	1.15280	0.27110	1.00019	0.34643
39	0.06203	1.15415	0.32518	1.04570	0.38158
40	0.06203	1.10502.	0.37929	1.10502	0.37929

LE RAD 0.01656   CENTER AT ALPHA -1.48493   UPSILON 0.77275
TE RAD 0.08563   CENTER AT ALPHA   1.07225   UPSILON 0.30017

PHASE II ROTOR

STAGE 2. ROTOR NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0. MU 0. ETA 0.

SECTION NO 11 SECTION LL RHO 3.5000

CHORD	STAGGER	CAMBER
2.6335	8.838	110.418

AREA 0.730463 SURFACE ARC LENGTH 6.40285

	ALPHA	UPSILON
SECTION C.G.	0.00506	0.04711
STREAMSURFACE SECTION C.G.	-0.00010	-0.00588
BLADE AXIS	-0.00010	-0.00588
STACKING AXIS (RADIAL)	-0.00010	0

106

PHASE II ROTOR

COORD SYSTEM ORIGIN Z -7.03630 R O.   STAGE 2. ROTOR   MU O.   NR 20   ETA O.

SECTION NO 12   SECTION MM   RHO 3.0000

MEANLINE INPUT DATA

PT	ALPHA	ZETA*	THICKNESS	UPSILON
1	-1.48236	38.327	0.04070	0.68887
2	-1.40857	37.416	0.06208	0.63195
3	-1.26226	35.453	0.10372	0.52518
4	-1.11781	33.153	0.14326	0.42796
5	-0.97503	30.660	0.18002	0.34036
6	0.81983	27.861	0.21683	0.25447
7	-0.65255	24.606	0.25257	0.17287
8	0.48756	21.565	0.28339	0.10342
9	-0.32520	19.080	0.30900	0.04379
10	0.16560	16.607	0.32937	-0.00750
11	0.00961	13.537	0.34442	-0.04988
12	0.14198	9.515	0.35363	-0.08123
13	0.28843	4.663	0.35609	-0.09961
14	0.42839	-2.644	0.35151	-0.10194
15	0.56098	-15.747	0.33837	-0.07719
16	0.68401	-34.445	0.31027	-0.00605
17	0.79508	-52.571	0.26384	0.13382
18	0.89506	-64.840	0.21949	0.36129
19	0.96982	-71.328	0.20957	0.62857

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA*
1	0 0250	0.01659	-1.48236	0.68887	38.327
2	0 0500	0.02384	-1.42106	0.64142	37.234
3	0 0750	0.03103	-1.35975	0.59547	36.461
4	0.1000	0.03813	-1.29845	0.55085	35.619
5	0.1250	0.04514	-1.23714	0.50767	34.696
6	0.1500	0.05203	-1.17584	0.46599	33.717
7	0.1750	0.05876	-1.11453	0.42586	32.690
8	0.2000	0.06531	-1.05323	0.38730	31.640
9	0.2300	0.07167	-0.99193	0.35029	30.594
10	0.2600	0.07903	-0.91836	0.30788	29.330
11	0.2900	0.08608	-0.84479	0.26763	28.025
12	0.3200	0.09281	-0.77123	0.22957	26.674
13	0.3500	0.09921	-0.69766	0.19373	25.263
14	0.3500	0.10527	-0.62410	0.16015	23.806
15	0.3800	0.11096	-0.55053	0.12875	22.446
16	0.4100	0.11627	-0.47697	0.09929	21.231
17	0.4400	0.12119	-0.40340	0.07154	20.106

107

PHASE II ROTOR

STAGE 2. ROTOR

COORD SYSTEM ORIGIN Z -7.03630 R O.   MU O.   NB 20   ETA O.

SECTION NO 12   SECTION MM   RHO 3.0000

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA*
18	0.4700	0.12570	-0.32983	0.04539	19.042
19	0.5000	0.12980	-0.25627	0.02074	17.987
20	0.5300	0.13348	-0.18270	-0.00236	16.872
21	0.5600	0.13674	-0.10914	-0.02384	15.645
22	0.5900	0.13954	-0.03557	-0.04346	14.180
23	0.6200	0.14185	0.03799	-0.06091	12.460
24	0.6500	0.14362	0.11156	-0.07586	10.466
25	0.6800	0.14475	0.18512	-0.08798	8.195
26	0.7100	0.14520	0.25869	-0.09695	5.664
27	0.7400	0.14490	0.33226	-0.10241	2.632
28	0.7700	0.14381	0.40582	-0.10303	-1.927
29	0.8000	0.14180	0.47939	-0.09665	-8.439
30	0.8300	0.13842	0.55295	-0.07984	-17.643
31	0.8600	0.13294	0.62652	-0.04770	-30.086
32	0.8900	0.12426	0.70008	0.00896	-44.550
33	0.9200	0.11179	0.77365	0.09983	-56.353
34	0.9500	0.09697	0.84721	0.23482	-66.094
35	0.9750	0.08817	0.90852	0.40441	-73.245
36	1.0000	0.08544	0.96982	0.62857	-75.345

CHORD 2.4529   STAGGER 1.408   CAMBER 113.672

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	I/C	UPPER ALPHA	UPPER UPSILON	LOWER ALPHA	LOWER UPSILON
1	0.01659	-1.48236	0.68887	-1.48236	0.68887
2	0.01659	-1.46700	0.67169	-1.46735	0.69742
3	0.01659	-1.48038	0.65852	-1.45253	0.69427
4	0.02384	-1.43875	0.61814	-1.40337	0.66469
5	0.03103	-1.38237	0.56487	-1.33714	0.62608
6	0.03813	-1.32569	0.51284	-1.27121	0.58887
7	0.04514	-1.26866	0.46215	-1.20563	0.55319
8	0.05203	-1.21126	0.41291	-1.14042	0.51906
9	0.05876	-1.15346	0.36520	-1.07561	0.48651
10	0.06531	-1.09525	0.31910	-1.01121	0.45550
11	0.07167	-1.03666	0.27463	-0.94719	0.42596
12	0.07903	-0.96584	0.22338	-0.87088	0.39238
13	0.08608	-0.89440	0.17444	-0.79519	0.36083
14	0.09281	-0.82233	0.12786	-0.72013	0.33129

108

STAGE 2. ROTOR   NB   20

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU 0.   RHO 3.0000   ETA 0.

SECTION NO 12   SECTION MM

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER ALPHA	UPPER UPSILON	LOWER ALPHA	LOWER UPSILON
15	0.09921	-0.74959	0.08369	-0.64573	0.30377
16	0.10527	-0.67621	0.04203	-0.57198	0.27828
17	0.11096	-0.60249	0.00797	-0.49857	0.25453
18	0.11627	-0.52861	-0.03364	-0.42532	0.23221
19	0.12119	-0.45450	0.06804	-0.35231	0.21112
20	0.12570	-0.38013	-0.10034	-0.27954	0.19112
21	0.12980	-0.30543	-0.13067	-0.20711	0.17216
22	0.13348	-0.23022	-0.15902	-0.13519	0.15430
23	0.13674	-0.15436	-0.18533	-0.06391	0.13765
24	0.13954	-0.07750	-0.20938	0.00635	0.12247
25	0.14185	0.00046	-0.23079	0.07553	0.10897
26	0.14362	0.07956	-0.24907	0.14356	0.09735
27	0.14475	0.15982	-0.26370	0.21043	0.08774
28	0.14520	0.24111	-0.27416	0.27627	0.08026
29	0.14490	0.32409	-0.27994	0.34042	0.07513
30	0.14381	0.41175	-0.27931	0.39989	0.07324
31	0.14180	0.50491	-0.26868	0.45386	0.07539
32	0.13842	0.60441	0.24162	0.50150	0.08195
33	0.13294	0.70825	-0.18878	0.54478	0.09338
34	0.12426	0.80699	0.09964	0.59317	0.11757
35	0.11179	0.88779	0.02386	0.65951	0.17580
36	0.09697	0.95594	0.18662	0.73849	0.28301
37	0.08817	1.01207	0.37324	0.80497	0.43559
38	0.08544	1.04460	0.49965	0.84504	0.57157
39	0.08544	1.03864	0.56932	0.89505	0.62188
40	0.08544	0.96982	0.62857	0.96982	0.62857

LE RAD	0.02281	CENTER AT ALPHA	-1.46441	UPSILON
TE RAD	0.10656	CENTER AT ALPHA	0.94132	UPSILON

·ZPC·

PHASE II ROTOR

STAGE   2.   ROTOR   NB   20

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU 0.   ETA 0.

SECTION NO 12   SECTION MM   RHO   3.0000

CHORD   STAGGER   CAMBER
2.4529   1.408   113.672

AREA   0.768532   SURFACE ARC LENGTH   6.33389

                                    ALPHA   UPSILON
SECTION C.G.   0.01879   0.10637
STREAMSURFACE SECTION C.G.   0.00278   0.02560
BLADE AXIS   0.00278   0.02560
STACKING AXIS (RADIAL)   -0.00010   0.

PHASE II ROTOR

STAGE 2. ROTOR

COORD SYSTEM ORIGIN Z -7.03630 R 0. MU 0. NB 20 ETA 0.

SECTION NO 13 SECTION NN RHO 2.5000

MEANLINE INPUT DATA

PT	ALPHA	ZETA*	THICKNESS	UPSILON
1	-1.46843	33.576	0.05417	0.61508
2	-1.39687	32.727	0.07447	0.56903
3	-1.25515	31.035	0.11408	0.48226
4	1.11527	29.391	0.15176	0.40201
5	-0.97712	27.818	0.18692	0.32740
6	0.82718	25.528	0.22261	0.25224
7	-0.66564	22.033	0.25805	0.18149
8	-0.50675	19.183	0.28926	0.12255
9	-0.35073	17.269	0.31599	0.07126
10	-0.19777	15.065	0.33850	0.02639
11	-0.04906	11.873	0.35666	-0.01020
12	0.09441	7.460	0.36974	-0.03527
13	0.23195	2.261	0.37632	-0.04675
14	0.36193	-5.955	0.37603	-0.04111
15	0.48344	-21.279	0.36706	-0.00379
16	0.59384	-41.640	0.34110	0.09017
17	0.69021	-58.845	0.29433	0.26813
18	0.77414	-69.331	0.25361	0.55105
19	0.83463	-74.648	0.25579	0.87786

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AI	T/C	ALPHA	UPSILON	ZETA*
1	0	0.02337	-1.46843	0.61508	32.938
2	0.0250	0.03042	-1.41085	0.57794	32.605
3	0.0500	0.03743	-1.35328	0.54166	31.814
4	0.0750	0.04437	-1.29570	0.50646	31.076
5	0.1000	0.05123	-1.23812	0.47222	30.415
6	0.1250	0.05798	-1.18055	0.43885	29.786
7	0.1500	0.06460	-1.12297	0.40630	29.173
8	0.1750	0.07106	-1.06539	0.37455	28.571
9	0.2000	0.07735	-1.00782	0.34359	27.968
10	0.2300	0.08469	-0.93872	0.30747	27.198
11	0.2600	0.09179	-0.86963	0.27272	26.151
12	0.2900	0.09865	-0.80054	0.23977	24.802
13	0.3200	0.10527	-0.73145	0.20890	23.335
14	0.3500	0.11162	-0.66236	0.18018	21.799
15	0.3800	0.11767	-0.59327	0.15355	20.401
16	0.4100	0.12339	-0.52417	0.12863	19.325
17	0.4400	0.12879	-0.45508	0.10496	18.498

PHASE II ROTOR

STAGE 2 ROTOR   NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU 0.   ETA 0.

SECTION NO 13   SECTION NN   RHO 2.5000

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	PCT AL	T/C	ALPHA	UPSILON	ZETA,
18	0.4700	0.13386	-0.38599	0.08238	17.706
19	0.5000	0.13860	-0.31690	0.06084	16.919
20	0.5300	0.14303	-0.24781	0.04040	16.012
21	0.5600	0.14713	-0.17872	0.02124	14.951
22	0.5900	0.15088	-0.10962	0.00363	13.587
23	0.6200	0.15426	-0.04053	-0.01200	11.857
24	0.6500	0.15721	0.02856	-0.02524	9.780
25	0.6800	0.15961	0.09765	-0.03570	7.368
26	0.7100	0.16135	0.16674	-0.04300	4.660
27	0.7400	0.16238	0.23583	-0.04687	1.692
28	0.7700	0.16264	0.30493	-0.04647	-2.759
29	0.8000	0.16205	0.37402	-0.03921	-9.632
30	0.8300	0.16028	0.44311	-0.02134	-19.892
31	0.8600	0.15642	0.51220	0.01289	-33.185
32	0.8900	0.14903	0.58129	0.07464	-49.647
33	0.9200	0.13645	0.65038	0.18101	-62.649
34	0.9500	0.11944	0.71948	0.34697	-71.442
35	0.9750	0.10919	0.77705	0.56468	-78.090
36	1.0000	0.11035	0.83463	0.87786	-80.199

CHORD 2.3180

STAGGER -6.509

CAMBER 113.137

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER ALPHA	UPPER UPSILON	LOWER ALPHA	LOWER UPSILON
1	0.02337	-1.46843	0.61508	-1.46843	0.61508
2	0.02337	-1.47261	0.59183	-1.44940	0.62827
3	0.02337	-1.46231	0.57500	-1.42943	0.62588
4	0.03042	-1.42985	0.54824	-1.39185	0.60764
5	0.03743	-1.37614	0.50480	-1.33041	0.57853
6	0.04437	-1.32225	0.46242	-1.26915	0.55051
7	0.05123	-1.26818	0.42102	-1.20806	0.52343
8	0.05798	-1.21393	0.38052	-1.14716	0.49717
9	0.06460	-1.15947	0.34093	-1.08647	0.47167
10	0.07106	-1.10478	0.30223	-1.02601	0.44688
11	0.07735	-1.04986	0.26441	-0.96577	0.42277
12	0.08469	-0.98359	0.22018	-0.89386	0.39477
13	0.09179	-0.91652	0.17723	-0.82275	0.36822
14	0.09865	-0.84850	0.13598	-0.75258	0.34356

112

PHASE II ROTOR

STAGE 2. ROTOR   NB 20

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU 0.   ETA 0.

SECTION NO 13   SECTION NN   RHO 2.5000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

PT	T/C	UPPER ALPHA	UPPER UPSILON	LOWER ALPHA	LOWER UPSILON
15	0.10527	-0.77978	0.09687	-0.68312	0.32093
16	0.11162	-0.71040	0.06006	-0.61432	0.30029
17	0.11767	-0.64080	0.02573	-0.54573	0.28137
18	0.12339	-0.57150	-0.00633	-0.47685	0.26358
19	0.12879	-0.50244	-0.03659	-0.40772	0.24652
20	0.13386	-0.43317	-0.06541	-0.33881	0.23017
21	0.13860	-0.36365	-0.09285	-0.27015	0.21453
22	0.14303	-0.29353	-0.11894	-0.20208	0.19974
23	0.14713	-0.22271	-0.14350	-0.13472	0.18599
24	0.15088	-0.15071	-0.16635	-0.06854	0.17361
25	0.15426	-0.07727	-0.18698	-0.00380	0.16297
26	0.15721	-0.00239	-0.20480	0.05951	0.15431
27	0.15961	0.07393	-0.21915	0.12137	0.14776
28	0.16135	0.15155	-0.22939	0.18193	0.14338
29	0.16238	0.23028	-0.23499	0.24139	0.14125
30	0.16264	0.31400	-0.23476	0.29585	0.14182
31	0.16205	0.40544	-0.22438	0.34259	0.14596
32	0.16028	0.50632	-0.19602	0.37990	0.15335
33	0.15642	0.61143	-0.13883	0.41297	0.16461
34	0.14903	0.71292	-0.03720	0.44967	0.18648
35	0.13645	0.79085	0.10835	0.50992	0.25367
36	0.11944	0.85071	0.30291	0.58824	0.39103
37	0.10919	0.90087	0.53856	0.65323	0.59079
38	0.11035	0.93569	0.72982	0.69175	0.79743
39	0.11035	0.92211	0.81429	0.74546	0.86203
40	0.11035	0.83463	0.87786	0.83463	0.87786

LE RAD 0.03050   CENTER AT ALPHA -1.44284   UPSILON 0.59848
TE RAD 0.12704   CENTER AT ALPHA 0.81079   UPSILON 0.75307

113

PHASE II ROTOR

ZPC

STAGE   2.   ROTOR   NR   20

COORD SYSTEM ORIGIN Z -7.03630 R 0.   MU   0.   ETA 0.

SECTION NO 13   SECTION NN   RHO   2.5000

CHORD   STAGGER   CAMBER
2.3180   -6.509   113.137

AREA   0.820570   SURFACE ARC LENGTH   6.34504

	ALPHA	UPSILON
SECTION C.G.	0.02779	0.18549
STREAMSURFACE SECTION C.G.	0.00565	0.05708
BLADE AXIS	0.00565	0.05708
STACKING AXIS (RADIAL)	-0.00010	0.

114

PHASE II ROTOR

STAGE 2. ROTOR   NB   20

SECT	NO	RHO	CHORD	STAGGER	CAMBER	TM/C	ZETA1	ZETA2
AA	1	8.50000	3.7089	58.04	3.81	0.02592	57.39	53.58
BB	2	8.00000	3.8794	55.24	6.22	0.02639	55.55	49.33
CC	3	7.50000	3.9493	51.85	7.68	0.03079	53.99	46.32
DD	4	7.00000	3.8618	46.90	13.29	0.03954	52.55	39.25
EE	5	6.50000	3.7626	41.88	20.73	.05267	51.18	30.46
FF	6	6.00000	3.6818	37.01	30.33	0.06350	50.00	19.67
GG	7	5.50000	3.6001	31.43	43.32	0.07320	48.75	5.43
HH	8	5.00000	3.4429	26.63	62.42	0.08278	47.04	-15.38
JJ	9	4.50000	3.1555	21.59	87.77	0.09593	45.48	-42.29
KK	10	4.00000	2.8686	15.68	101.57	0.11198	44.52	-57.05
LL	11	3.50000	2.6335	8.84	110.42	0.12819	42.24	-68.18
MM	12	3.00000	2.4529	1.41	113.67	0.14520	38.33	-75.35
NN	13	2.50000	2.3180	-6.51	113.14	0.16264	32.94	-80.20

THE COORDINATES FOR THIS BLADE WERE PUT ON TAPE

IN THE SAME ORDER AS PRINTED ABOVE

SECTION XII

REFERENCES

1. A.J. Wennerstrom, and W.A. Buzzell, <u>Redesign of a Rotor for a 1500 ft/sec Transonic, High-Through-Flow, Single-Stage Axial-Flow Compressor with Low Hub/Tip Ratio</u>, Air Force Aero Propulsion Laboratory, Wright-Patterson AFB, Ohio 45433, AFAPL-TR-2078, September 1979.

2. George R. Frost, Richard M. Hearsey, Arthur J. Wennerstrom, <u>A Computer Program for the Specification of Axial Compressor Airfoils</u>, Aerospace Research Laboratories, Wright-Patterson Air Force Base, Ohio 45433, ARL 72-0171,

3. Richard M. Hearsey, <u>A Revised Computer Program for Axial Compressor Design Volume I</u>, Aerospace Research Laboratories, Wright-Patterson Air Force Base, Ohio 45433, ARL TF 75-0001, January 1975.

4. Arthur J. Wennerstrom, Personal Communication to L.H. Smith of General Electric Company, September 12, 1980.